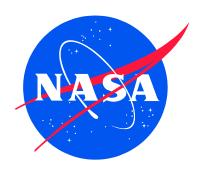
## NASA GLENN RESEARCH CENTER



# SAFETY AND ASSURANCE DIRECTORATE SAAD/Q

ANNUAL OPERATING AGREEMENT (AOA) FY 2005

The undersigned parties have approved this Annual Operating Agreement that specifies the safety, environmental, risk management, and quality assurance products and services provided by the NASA Glenn Research Center, Safety and Assurance Directorate in support of the Center's aeronautics and space programs.
DIRECTOR OF SAFETY AND ASSURANCE DIRECTORATE NASA GLENN RESEARCH CENTER
DIRECTOR, NASA GLENN RESEARCH CENTER
CHIEF SAFETY AND MISSION ASSURANCE OFFICER
ASSOCIATE ADMINISTRATOR FOR AERONAUTICS RESEARCH
ASSOCIATE ADMINISTRATOR FOR INSTITUTIONS AND MANAGEMENT

This Annual Operating Agreement has been prepared and adopted by the following GRC SAAD Staff:
CHIEF ENGINEER, SAFETY AND ASSURANCE DIRECTORATE NASA GLENN RESEARCH CENTER
CHIEF, RISK MANAGEMENT OFFICE NASA GLENN RESEARCH CENTER
CHIEF, QUALITY MANAGEMENT OFFICE NASA GLENN RESEARCH CENTER
CHIEF, GLENN SAFETY OFFICE NASA GLENN RESEARCH CENTER
CHIEF, ENVIRONMENTAL MANAGEMENT OFFICE
NASA GLENN RESEARCH CENTER
CHIEF, DECOMMISSIONING PROGRAM OFFICE NASA GLENN RESEARCH CENTER
TWO COLUMN TEOL MONTOLINIEN
EXECUTIVE OFFICER, SAFETY AND ASSURANCE DIRECTORATE NASA GLENN RESEARCH CENTER

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#### 1.0 INTRODUCTION

The NASA Glenn Research Center (GRC) Safety and Assurance Directorate (SAAD) Annual Operating Agreement (AOA) for FY05 establishes agreement among: The Director, NASA Glenn Research Center; the Director, Safety and Assurance Directorate; the NASA Chief Safety and Mission Assurance Officer; the NASA Associate Administrator for Aeronautics Research; and the NASA Associate Administrator for Institutions and Management. The AOA summarizes the Safety, Environmental, Risk Management, and Quality Assurance products and services provided in support of GRC research and technology programs and the Center's institutional operations for FY05, and provides estimates for the out-years. The AOA details SAAD activities and processes, the metrics that will be used to gauge success, key deliverables for FY05, resources for FY05, and resource planning for FY05 through FY09.

#### 1.1 PURPOSE

This Agreement outlines GRC SAAD support of Center, Headquarters, and Agency programs, activities, and operations in furtherance of the goals and objectives of the four Mission Directorates. All of these are encompassed in the diverse work products of the GRC. With primary focus on aeronautics and space propulsion, SAAD also supports the Center's significant activities in Microgravity space science, International Space Station power and science utilities, space communications, power, and other technology developments. The Office provides assessment, assurance, oversight, and insight capabilities that enable the various cross-cutting processes and optimize the value of the contributions made at GRC. SAAD activities in support of these Mission Strategic Initiatives are reflected in the detailed descriptions found in Sections 2 through 6.

#### 1.2 SAAD MISSION

The mission of the GRC SAAD is to promote and advance the goals of the Center, NASA, and the Nation: to meet and exceed the expectations of those who rely on us to assure product safety and quality, program mission success and a safe, secure, environmentally sound and healthful workplace. We accomplish this through the development and application of value-added practices and services that identify, manage, and mitigate risk.

#### 1.3 SAAD GOALS, OBJECTIVES, AND MEASURES

- Ensure a safe, secure, environmentally sound and healthful workplace for the employees and the community. Use incident/mishap frequencies and severity, close calls, and the cost of damaged property, as metrics to drive an effective Center Safety Program. Provide GRC workforce, visitors, and neighbors an environment free from the threat of safety and health hazards; meet all regulatory standards; and support both the GRC mission and quality of life.
- 2. Assure that safety requirements are met for all space flight projects and that program and project mission risks are consistent with NASA and Center goals.
- 3. Support the GRC Exploration Systems and Aeronautics Programs by the application of appropriate Safety and Mission Assurance (SMA), Risk Management disciplines, and techniques to improve the likelihood of mission success.
- 4. Support the Science and Space Operations Programs with appropriate SMA disciplines and risk reduction technologies.
- 5. Maintain SAAD as the Office of Excellence at GRC in the development, implementation, and maintenance of process control technologies and tools. Lead the Center to its fullest understanding of the value of process controls to assure the success of GRC programs, operations, and activities.
- 6. Provide an array of SMA and environmental products and services, which meet and exceed the expectations of our customers. Maintain the Center's registration to ISO 9001 and ISO 14001.
- 7. Seek and develop new technologies that can be applied to improve the SMA and Environmental Management disciplines, and will enhance the value added to program, operations, and facility support.

#### 1.4 AOA ASSUMPTIONS

- 1. GRC will continue to perform significant work in support of NASA's initiatives in Exploration Systems, Space Operations, Science, and Aeronautics Research.
- 2. SAAD is responsible for assuring the implementation of appropriate, adequate, and effective environmental and SMA programs for GRC projects and operations. This is accomplished with the direction and support of Agency and Center Management.
- 3. SAAD is responsible for assuring that all GRC employees work in a safe, secure, and healthful environment.
- 4. Resources are planned consistent with the workforce and budget requirements at GRC.
- 5. Planned resources for civil servant complement, Research Operations Support, Program Support, SMA projects, and Construction of Facilities projects, will be available.
- 6. The internal and external regulatory environment will remain relatively stable, with regulatory requirements becoming somewhat more stringent over time.
- 7. Ongoing remedial investigations at GRC will not reveal significant new environmental hazards beyond those for which mitigation and remediation have been planned.

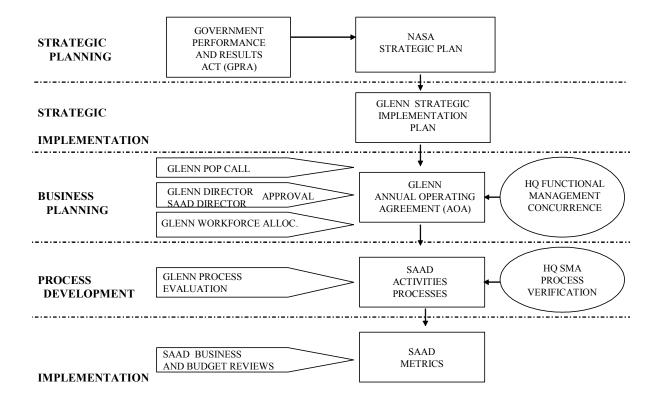
#### 1.5 STRATEGIC LINKAGES

This AOA outlines a plan for FY05 that reflects the NASA requirements from top-level NASA and GRC documents as shown in Figure 1.0. Through these relationships, the AOA is directly linked to the goals and objectives contained in the NASA Strategic Plan.

The AOA references the goals of the NASA Strategic Plan for which SAAD will provide significant support during the year. Table 1.0 lists these goals and delineates the applicable AOA functional activities that relate to them.

Figure 1.0

#### **SMA OPERATIONAL STRUCTURE**



### TABLE 1.0. AOA LINKAGES TO NASA STRATEGIC PLAN

STRATEGIC PLAN GOAL		AOA FUNCTIONAL ACTIVITY			
	NASA GOALS				
2	Enable a safer, more secure, efficient, and friendly air transportation system.	3.1 AERONAUTICS			
3	Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.	3.1 AERONAUTICS			
4	Explore the fundamental principles of physics, chemistry, and biology through research in the unique natural laboratory of space.	3.3.2 MICROGRAVITY SCIENCE			
5	Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.	3.3 EXPLORATION SYSTEMS			
8	Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.	3.4.1 ISS EPS SUBSYSTEM MANAGEMENT 3.4.2 RETURN TO FLIGHT			
9	Extend the duration and boundaries of human space flight to create new opportunities for exploration and discovery.	3.3 EXPLORATION SYSTEMS			
10	Enable revolutionary capabilities through new technology.	3.2 SCIENCE			
	NASA IMPLEMENTING STRATEGIES	AND OBJECTIVES			
IS-3	Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance and reduce cost.	3.5 ASSURANCE TECHNOLOGY CENTER			
IS-4	Ensure that all NASA work environments, on Earth and in space, are safe, healthy, and environmentally sound and secure.	5.0 GLENN SAFETY OFFICE 6.0 ENVIRONMENTAL MANAGEMENT OFFICE			
IS-5	Manage risk and cost to ensure success and provide the greatest value for the American public.	3.0 RISK MANAGEMENT OFFICE 4.0 QUALITY MANAGEMENT OFFICE			

#### 1.6 EXECUTIVE SUMMARY

Five organizational offices, along with the Directorate-level staff office, comprise the Glenn Safety and Assurance Directorate (SAAD) and are delegated the responsibilities to meet the mission, goals, and objectives detailed in this AOA. Figure 2.0 summarizes the key activities and processes for each of SAAD's five division level offices. Sections 2 through 6 of this AOA provide an overview of the Division level offices and the Decommissioning Project Office planned operations, management issues and concerns, key FY05 deliverables, and associated metrics.

**The Management Operations Staff Office (Q)** is the focus for strategic, business, and resource allocation planning in the Office. The Office assures the adequate implementation of NASA and GRC administrative, human resources, and fiscal policies, while supporting office managers and personnel in providing centralized resource, technical, personnel, and administrative management expertise.

The Decommissioning Project Office (QD) is tasked with the safe decommissioning of the Plum Brook Reactor Facility (PBRF) and the timely termination of the Nuclear Regulatory Commission (NRC) "possess but do not operate" license. This includes the decontamination, demolition, and disposal of equipment, systems, soil, buildings and structures that comprise PBRF. The Office is the central point of contact with the NRC and the other state, federal, and local regulators as well as the public.

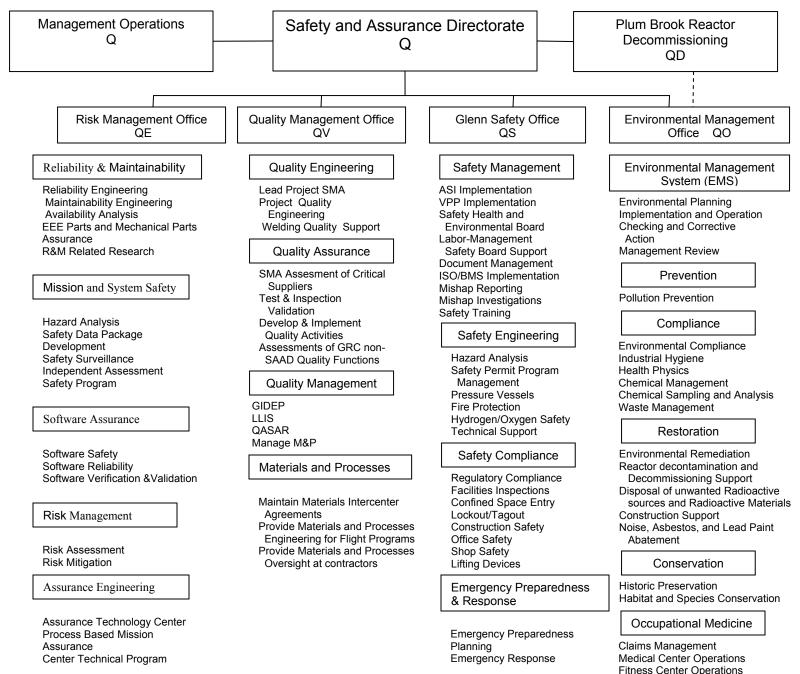
**The Risk Management Office (RMO QE)** is tasked with providing assurance, insight, independent assessment, and SMA support to GRC Aerospace Programs/Projects in a wide range of disciplines. These include assurance management, system safety, risk management, reliability/availability/maintainability, software quality and safety, and EEE parts engineering.

**The Quality Management Office (QMO QV)** provides the Center with the capability to assess the efficacy of its process controls and those of its suppliers through internal and external quality assessments. The Office maintains Materials Inter-Center Agreements with other NASA Centers and provides materials and processes review and approval for space flight programs. QMO provides quality assurance insight, independent assessment, quality engineering and material and processes support to programs and projects.

The Glenn Safety Office (GSO QS) is responsible for the development, implementation, and execution of a safety program that is compliant with all applicable regulatory requirements. The safety program assesses the risks of GRC activities and operations, and informs cognizant management of those risks and the recommended actions developed to mitigate them. In addition, the Office is the Center lead for the implementation of the Agency Safety Initiative and the Voluntary Protection Program (VPP). The GRC Emergency Planning and Response function is managed within the Glenn Safety Office.

The Environmental Management Office (EMO QO) is tasked with developing and managing an environmental management system at GRC that complies with Executive Order requirements and ensures compliance with all governing regulations; identifies risks posed by current and past GRC programs, operations, and activities (and by those of the predecessors on its sites); develops and implements processes to remediate, abate, and control these risks; and reports these activities to GRC and NASA Management. In addition to environmental management, EMO manages the Center Occupational Health Program. Comprehensive Industrial Hygiene and Health Physics elements support GRC research operations. The Occupational Safety and Health claims management, Medical Services, and the Fitness Center complete the elements of the program.

The resources planned for the FY05 activities are summarized for each office in Appendix 1; which details both fully-funded activities and over-guideline, or under-funded activities. Appendix 2 summarizes the resources and activities planned by each office for both FY05 and future years. High-level summary spreadsheets for all of SAAD are provided in Figures 2-0 and 2-1 of Appendix 2.



#### 1.6.1 SAAD ISSUES AND CONCERNS

- Risk Management Office none
- Quality Management Office none
- Glenn Safety Office none
- Environmental Management Office none

#### **1.6.2 METRICS**

Metrics for the FY05 AOA will be updated on a monthly basis and will be posted on the SAAD website. These can be accessed at: <a href="http://smad-ext.grc.nasa.gov/smad/index.html">http://smad-ext.grc.nasa.gov/smad/index.html</a>. Final metrics for FY99 through FY04 are also posted.

#### 1.7 PROCESSES/ACTIVITIES FOR SPECIAL ATTENTION

## 1.71 NASA ENGINEERING AND SAFETY CENTER/INDEPENDENT TECHNICAL AUTHORITY

NASA Engineering and Safety Center (NESC)

SAAD will provide a GRC representative to the NESC SMA Board who will provide continuous input to the NESC, in conjunction with the GRC NESC Chief Engineer, about Program and Project concerns which are of interest to the NESC. The SAAD NESC SMA Board representative will work with the NESC to identify the Subject Matter Knowledge Experts available at GRC in conjunction with the needs of the NESC and the Super Problem Resolution Teams. The SAAD NESC SMA Board representative will assist the NESC is developing policies, procedures and techniques for problem trending and problem reporting. Estimated total civil Service requirement is 1 FTE from SAAD.

Independent Technical Authority (ITA)

SAAD will be a member of the ITA Steering Committee and support the Committee implementation with SAAD Review Board processes for ITA decision-making, assuring safe and technically sound ITA decisions in a timely manner. The SAAD will continue to fill a leadership role for the FMEA, hazard, and other quality, safety, reliability and mission assurance products. The SAAD will provide Subject Matter Knowledge experts to provide technical support to these functions, along with leadership and tracking to ensure that Risk management, FMEA, hazard analyses, problem reporting, trending and anomaly tracking functions are performed appropriately across Center. SAAD will assist the performing organizations with the hazard and integrated hazard analyses and work with the ITA in the approval and integrating function. The GRC SAAD will support the certification of all flight activities as requested by the ITA. Estimated total Civil Service requirement is 2-3 FTE from SAAD.

#### 1.7.2 SOFTWARE ASSURANCE

Software Assurance (SA) is a multi-discipline function that ensures safe, reliable, and secure software products of high quality are delivered to and used within NASA. SA assists in risk identification and mitigation by minimizing defects, preventing problems, and enabling improvement of future products and services. The SA process is a planned and systematic set of activities that ensure conformance of software life cycle processes and products to specified requirements, standards, and procedures. This process can be applied to programs, projects, and facilities.

While keeping abreast of the latest advances in software engineering, software management, and software assurance, the RMO provides SA support to numerous projects in Microgravity, Aeronautics, Facilities, Space Transportation, and Space Communication. A portion of the SA efforts is dedicated to researching and advancing the state-of-the-art in software assurance, software management, and software safety. This is performed through the NASA Office of Safety and Mission Assurance, Software Assurance Research Program. In addition, SA personnel develop and teach classes for formal inspections, software safety, and general software processes. SA personnel are a vital part of the GRC Software Engineering Process Group and the GRC Software Working Group, as well as the NASA Software Working Group and NASA Software Assurance Working Group, helping to institute the best software processes, procedures, and guidance for Glenn's software engineers, scientists, and managers.

All software developed and managed at GRC needs to be evaluated for the level of software development control and the need for Independent Verification and Validation (IV&V). SA can assist project management with these evaluations. The required SA activities applied to a project are directly related to the software control level and the need for IV&V. Since SA and IV&V activities overlap, an agreement is made by project management on which areas to individually focus SA and IV&V. SA activities, and possibly IV&V activities, must be applied to all medium, high, and critical control level software efforts. SA activities for low control levels will only be considered on an as needed or desired basis depending on resources.

#### 1.7.3 TRAINING

SAAD provides web-based training for all SMA professionals through the Professional Development Initiative (PDI); available at: https://solar.msfc.nasa.gov. Provisions are made for developing, institutionalizing, utilizing, and continually improving a comprehensive and documented training and career development program. Each Staff member plans a program of study and develops their skills using the Individual Development Program, which is reviewed and approved each year as part of the Performance Review process.

The Glenn Safety Office, Risk Management Office, and the Environmental Management Office are working to improve the training survey process that is being developed. This process was designed to obtain from supervisors, safety, health, and environmental training needs information. This information is used to develop the training plan for the following fiscal years. In addition, this information will be used to develop Job Safety Analysis for all job series in the Center. The Glenn Safety Office continues to coordinate training needs with the NASA Safety Training Center (NSTC) at JSC. The master training schedule includes training the NSTC will be offering at GRC, as well as contracted training and in-house training.

#### 1.7.4 SAFETY AND ENVIRONMENTAL PROGRAMS

#### 1.7.4.1 AGENCY SAFETY INITIATIVE (ASI)

ASI implementation is continuing. The Hazard Analysis Program has been developed and is being implemented. The PEP results of the past three years demonstrate that the program has the correct emphasis and has had a positive impact on the Center even though last year's numbers slipped a little. A Glenn Safety Office (GSO) safety point of contact has been assigned to each Directorate to assist that organization in responding to the PEP results. There is a concern that if FY05 funding is less than projected, there may be a negative impact on full implementation of ASI as currently scheduled.

#### 1.7.4.2 VOLUNTARY PROTECTION PROGRAM (VPP)

The Center continues to implement the plan for VPP certification at the Glenn Research Center (GRC). The plan was approved by the Safety, Health and Environmental Board and has the concurrence of the local OSHA office. To date, implementation has focused on Application, Advancement, and Awareness. The VPP Star Recognition evaluation is being scheduled with OSHA based on the VPP pre-evaluation.

#### 1.7.4.3 AIRCRAFT SAFETY

GSO supports on-going Center aircraft activities through coordinating technical reviews of safety, engineering, and operational reviews. The safety office's technical support of aircraft operations is based upon the risk management principles outlined in NPG 7120.5A. Interaction and dialogue of safety related issues, for aircraft operations and research, occurs between GSO and aircraft personnel, including the Aircraft Operations Office Chief, Aviation Safety Officer, Pilot (s), and Aviation Safety Committee Chair.

The Glenn Safety Office also provides third party review for on-going aircraft programs and operations through participation on the Aviation Safety Committee. This committee is comprised of members from across the Center with specific knowledge, skills and experience applicable to aircraft worthiness (structure and power plant) and for experiments conducted on and with the aircraft. Configuration control is also a vital component of aircraft operations, and GSO assists, as needed, with flight work order documentation. The aircraft maintenance quality assurance function is included in the assessment program conducted by the SAAD Quality Management Office.

#### 1.7.4.4 ENVIRONMENTAL MANAGEMENT SYSTEM

NASA Glenn Research Center, Lewis Field, Environmental Management System ISO 14001 registration was transferred to NQA on September 5, 2002 and is due for renewal by November 9, 2005. Internal and registrar audits continue to identify needs for improving employee understanding of their role in helping achieve the Center's environmental objectives. During FY 2005 the Environmental Management Office (EMO) will:

- Update the Center's EMS objectives and targets.
- Improve the web-based EMS awareness training.

#### 1.7.4.5 CLEVELAND HOPKINS AIRPORT EXPANSION

Environmental remediation of the NASA property involved in the Cleveland Hopkins Airport expansion was completed in June 2004. An Environmental Baseline Assessment and Suitability for Transfer report completed in July 2004 was approved by Ohio EPA in July. During FY 2005 the EMO will continue to support the Center in transferring the property to the City of Cleveland. As the project winds down the EMO can now direct resources to completing the remaining remediation required in the Central-West Area and the Firing Range.

The Glenn Safety Office continues to dedicate resources to this project. Currently there are three members of the staff providing support ranging from 20 to 40% of their time. GSO predicts that the amount of support will decrease during FY05 as the individual projects come to completion.

#### 1.7.4.6 INTEGRATED ASSET MANAGEMENT

The EMO is supporting the Center's efforts in the NASA-wide Integrated Asset Management (IAM) program. The IAM program's goal is to improve agency processes and procedures for planning, acquiring, maintaining, and disposing of assets. The program will significantly impact the Center's safety, health, and environmental programs. To support this effort EMO has one employee assigned to the IAM Core Team and one assigned to the extended team.

#### 1.7.5 SPACE ACT AGREEMENT - TUSKEGEE UNIVERSITY

NASA GRC and Tuskegee University have entered into a Space Act Agreement for the purposes of having NASA GRC transfer its expertise and to provide training in order to assist Tuskegee in enhancing its existing safety, health, environmental, and risk management program.

NASA and Tuskegee together will develop training that will educate the faculty, staff, and students of Tuskegee about safety, health, environmental, and risk management policies and procedures. The trainings will cover topics such as identifying workplace hazards, developing an effective workplace safety, health and environmental culture, assisting participants with the development of safety, health and environmental programs within their workplace, and the application of risk management to programs/projects.

#### Tuskegee will:

- 1. Provide sample, overview, and/or summary information relative to Tuskegee's current safety, health, environmental and risk management program via site visits to Tuskegee.
- 2. Develop a training document(s) incorporating the expertise from NASA GRC and Tuskegee that can be used as a model by other entities in establishing a safety and assurance technologies program.

#### NASA GRC will:

- 1. Provide selected training to Tuskegee personnel relative to safety, health, environmental and risk management issues.
- 2. Provide the requisite training either at Tuskegee University or at NASA GRC.
- 3. Provide training materials to Tuskegee.

### 2.0 SAAD MANAGEMENT OPERATIONS (OMO/Q)

The SAAD Management Operations Office (OMO) manages the Cost Center, NASA Headquarters Code Q Work Breakdown Structure (WBS), and the CoF funding for the entire SAAD organization. In addition, personnel actions, training, travel, overtime, workforce planning, space management and awards are managed by this group. Personnel actions include promotions, transfers, and interim changes to employee status. Personnel records are maintained by each Division. Workforce planning activities are also managed at a top level by this group to ensure the needed skills and staffing are reached and maintained. Training actions are processed for the staff and coordinated with the Organizational Development and Training Office. Staff Management of technical professional development, engineering policy, and customer interfaces is also provided by OMO. Monthly Business Reviews are held to monitor costs against plan for institutional, programmatic, training, travel, overtime, and awards budgets. The Director of SAAD chairs the reviews and each Office Chief or their representative is in attendance.

Functional Activity Summaries that detail activity planning are at the end of this section. A Resource Summary for FY05 OMO is depicted in Figure 1-0 in Appendix 1. Out-year estimates are found in Figure 2-2 of Appendix 2.

#### 2.1 CODE Q MANAGEMENT

A number of Code Q Center Technical Program Plans have been submitted in full cost format for FY05. These Plans include WBSs 104-07-01 through 104-07-05. The Technical Plans support Software Assurance, Safety, Risk Management, Probabilistic Risk Assessment and Non-Destructive Evaluation initiatives. Procurement actions are taken by the responsible technical manager based on authority received. Costs are projected to meet the current year 85 percent costing metric.

#### 2.2 COST CENTER MANAGEMENT

The Cost Center budget (General & Administrative expense) supports administrative staff and technical support for the Offices, along with all purchased goods and services. Purchase requisitions originate within any of the Divisions and are processed electronically to the Procurement Division. Cost Center funding must be 85% costed by fiscal year end.

#### 2.3 CONSTRUCTION OF FACILITIES (CoF) MANAGEMENT

Funding requirements for support of environmental activities relating to remedial investigation/feasibility studies and remedial design are coordinated with NASA Headquarters Code JE. CoF funding for the Environmental Management Office and the Plum Brook Decommissioning Office is tracked by the Environmental Management Office and PBRF Decommissioning Project Office, as appropriate.

#### 2.4 OMO METRICS

- 1. Cost 85 percent in current fiscal year for Code Q funds
- 2. Cost 85 percent in current fiscal year for Cost Center funds
- 3. Obligate 90 percent in current fiscal year for CoF funds
- 4. No greater than 5 percent difference between planned travel and actual cost on a quarterly basis
- 5. Maintain 85 percent of training budget allocated for in-house skill development versus advanced degrees

# **SAAD MANAGEMENT OPERATIONS Annual Operating Agreement Elements – FY2005**

#### ACTIVITY DESCRIPTION: CODE O MANAGEMENT

Center Technical Program Plans (CTPPs) are developed each year by the Safety and Assurance Directorate (Q/8000) personnel and other Directorates at the Center. Projects approved by NASA Headquarters, Code Q, receive funding. Funding is received at the overall program level and is then allocated to the approved projects. Code Q has mandated 85% cost and 100% obligation requirements for current year funds. More than half the funds support activities within the Q/8000 Directorate. The remaining funds support activities in the other Directorates at the Center.

Goal	Task(s)	Metric (Target)
<ol> <li>85% costed in current FY</li> <li>All obligated in current FY</li> </ol>	Code Q cost performance	<ol> <li>Percent funds costed</li> <li>Percent funds obligated</li> </ol>

#### ACTIVITY DESCRIPTION: COST CENTER FUNDING MANAGEMENT

Funds are allocated to 8000 activities in Institutional Safety, Risk Management, Quality Management and Environmental. Funds are distributed from GRC's General & Administrative expense pool as Cost Center funding. The majority of commitments provide support service contractors for the organizations. Funds are committed early in the fiscal year and closely tracked to cost projections for the Offices.

Goal	Task(s)	Metric (Target)
85% costed in current FY	Cost Center cost performance	Percent costed

#### ACTIVITY DESCRIPTION: : CONSTRUCTION OF FACILITIES (COF) MANAGEMENT

Environmental Compliance and Restoration -- Requirements are identified by a planning process that includes appropriate personnel from facilities, Plum Brook, and the Environmental Management Office (EMO). The requirements are communicated to NASA Headquarters, Code JE, and funding requests are submitted when projects are ready to move forward. Once funding is received, projects are managed either by the PBRF Decommissioning Office, EMO, or the Facilities and Test Engineering Division.

Goal	Task(s)	Metric (Target)
90% obligation in the current FY	CoF obligations for the completion of Remedial investigation/feasibility studies, preparation of remedial designs, and contracting for remedial actions.	Percent obligated

### 2.0A DECOMMISSIONING PROJECT OFFICE (DPO/QD)

The objective of the Plum Brook Reactor Facility (PBRF) Decommissioning Project Office is to enable the termination of the Nuclear Regulatory Commission (NRC) licenses by 2007. To accomplish this, the Project Office will safely remove and dispose of contaminated equipment, components, and systems; safely decontaminate buildings and structures; safely demolish all existing buildings and structures; and appropriately dispose of the contaminated wastes that result, including contaminated material and soil.

The PBRF Decommissioning Project Office (PO) provides general management, safety, environmental engineering, and technical oversight for the PBRF Decommissioning Project. A Federal Sector Team of experts and contractors supports the PO, and various Glenn Research Center (GRC) offices also provide direct and indirect support. The Federal Sector Team consists of members from NASA, the US Army Corps of Engineers (USACE), and the Department of Energy - Argonne National Laboratory (DOE-ANL). Other SAAD offices that support the Decommissioning Project Office include the Risk Management Office, Quality Management Office, Glenn Safety Office, and Environmental Management Office. In addition to USACE and DOE-ANL, there is direct contractor support for Community Relations (*Focus Group*), and Station Safety, Administrative, and Health Physics Services (the Plum Brook Operations Support Group (PBOSG)).

The key activities for the Decommissioning Project Office for the next year include the continued implementation and maintenance of the following Project-governing management documents and the execution of its responsibilities as defined therein, including:

- NRC Approved Decommissioning Plan
- PBRF Decommissioning Project Plan
- Environmental Monitoring Program
- PBRF Risk Management Plan
- Community Relations Plan
- NASA –USACE Operations Plan

The Project Office also provides support and information to the following independent review and oversight activities to assure Project integrity and success:

- Glenn (Governing) Program Management Council
- Glenn Center Director Briefings
- Glenn Safety, Health and Environmental Board
- Decommissioning Safety Committee
- GRC Office of Strategic Management (OSM) Integrated Independent Reviews

The Project supports and executes other activities critical to its success, as described in greater detail in the following sections, including:

- National Environmental Policy Act (NEPA) Process
  - Environmental Baseline
  - Historical Documentation
- Planning and Procurement
  - Ongoing procurement activities for Decommissioning Operations Contractor
  - o Procure equipment and services for Decommissioning Operations
- Decommissioning Activities
  - Continue Characterization activities
  - Segment Reactor Vessel and strip Containment Building of contaminated materiel
  - Remove and dispose of Vessel Segments and other Radioactively contaminated wastes
  - Dispose of loose equipment, systems, and other components from the site
  - Abate asbestos, lead paint and other hazardous material

The Resource Summary for FY05 operations is depicted in Figure 1-5 of Appendix 1. Out-year resource estimates can be found in Figure 2-7 of Appendix 2.

#### 2.1A PROJECT MANAGEMENT

The project management approach of the PBRF Decommissioning Project Office incorporates some unique implementations of the Project Plan as outlined in NASA Policy Guidance NPG7120.5A to reflect this multi-year C of F project. Also included is the ongoing execution of the Environmental Monitoring Program, implementation of the Community Relations Plan, implementation of NASA Continuous Risk Management using the PBRF Risk Management Plan, and close review and oversight by GRC and NASA Management.

The oversight is provided by the Glenn Program Management Council, Glenn Center Director Briefings, Safety, Health and Environmental Board, and GRC OSM Independent Assessment.

The critical deliverables for FY05 are:

- Continued implementation of the PBRF Decommissioning Project Plan and of the Operations Plan
- Continued refinement and execution of the PBRF *Decommissioning Risk Management Plan* and Risk Database
- Continued implementation of the Environmental Monitoring Program, refinement of the Environmental Baseline Study, and execution of the Historical Preservation protocols
- Continued implementation of the Community Relations Plan
- Development and execution of Work Plans, Implementing Procedures, and Work Execution Packages.

#### 2.2A DECOMMISSIONING PLAN EXECUTION

The *PBRF Decommissioning Project Plan* was submitted to the Nuclear Regulatory Commission (NRC) on December 20, 1999, and approval was received on March 20, 2002.

The critical deliverables for FY05 are:

- Respond to the NRC inquires and inspection findings in a timely manner
- Revise the *PBRF Decommissioning Project Plan*, if required, to accommodate any needed changes

#### 2.3A NEPA PROCESS

The NRC has submitted their NEPA-required *Environmental Assessment* (EA). NASA submitted their NEPA-required EA, and after careful analyses, a subsequent *Finding Of No Significant Impact* (FONSI) was made. The Ohio State Historical Preservation Officer was contacted and the State required no further actions. However, NASA has decided to preserve the historical significance of the facility and has developed a Historical Preservation Plan.

The critical deliverables for FY05 are:

- "Execute" the Historical Preservation Plan
- "Update," via the Environmental *Management Plan* and the *Environmental Baseline Survey Report* (specifically the Data Gap closures, as the information for closure becomes available)

#### 2.4A PRE-DECOMMISSIONING ACTIVITIES CLOSEOUT

Some *pre-decommissioning* activities started, in FY01 and FY02, were performed without the need for, and outside the auspices of, a NRC approved Decommissioning Plan. These items included activation of facility support systems and removal of loose equipment from PBRF. The formal *pre-decommissioning* activities started in FY01 and were completed in FY02. Some items were completed before decommissioning activities began and others continued as part of the decommissioning activities. Each activity required a characterization of hazards and then development of plans and procedures to implement the sampling, analysis, and eventual abatement or removal and disposal of these hazards.

#### 2.5A PLANNING AND PROCUREMENT

NASA approves all the procurement activities and strategies for the execution of the PBRF decommissioning design and decommissioning phases of the project. The PO will review, and approve plans required to execute the decommissioning design and decommissioning of the PBRF. The following plans, previously developed, will be refined, revised, and approved as necessary by the PO: *Project Plan, Operations Plan, Environmental Management Plan, Radiation Protection Plan, Respiratory Protection Plan, Risk Management Plan, Safety and Health Plan, Nuclear* and *Hazardous Waste Management Plan.* The Federal Sector Team and their contractors may develop and will execute these plans. NASA, as the licensee, is ultimately responsible for the implementation and control of these plans and their implementing procedures.

The critical deliverables for FY05 are:

- Maintain the cost and schedule baseline and phasing plan for each year of the project as refined for each Program Operating Plan (POP) cycle
- Complete, and submit to the NRC for approval, the Decommissioning Final Status Survey Plan that will justify NASA's efforts to leave the site in a condition that will support future use.
- Prepare and approve all procurement for decommissioning design, and the decommissioning phases of the project
- Revise, as necessary, the Inter-Agency agreements for decommissioning design, and the decommissioning phases of the project
- Refine the schedule of key environmental activities as overlaid on the overall PBRF Decommissioning Project schedule
- Revise, if necessary, any plans required to execute the various phases of the PBRF Decommissioning Project

#### 2.6A DECOMMISSIONING ACTIVITIES

The decommissioning activities started in mid-FY02 and will continue for approximately 5 years.

The critical deliverables for FY05 are:

- Complete the Reactor Vessel segmentation
- Conclude vital Characterization activities
- Complete *Loose Equipment* removal from the Reactor Containment Building and all other lab areas
- Maintain the site infrastructure to support Decommissioning activities including temporary services, waste removal, and waste disposal
- Execute the Decommission activities within the scope of the budget constraints for FY05, including *Loose Equipment* removal, vessel segmentation and removal, general decontamination and demolition, and waste removal

### 3.0 RISK MANAGEMENT OFFICE (RMO/QE)

The Risk Management Office (RMO) support activities are described in the following Sections of the GRC SAAD AOA. RMO provides Safety and Mission Assurance (SMA) engineering support to GRC programs/projects and the institutional sector. The SMA key areas of support for RMO include:

The Aeronautics Technology, Space Flight, Space Science, Biological and Physical Research, Exploration Systems Enterprises, and the Office of Safety and Mission Assurance, in the following disciplines:

Project Management
Risk Management
Assurance Engineering
System Safety
Reliability and Maintainability
Software Product Assurance
FAA Liaison
Process Based Mission Assurance (PBMA)

Functional Activity Summaries that detail planning are at the end of this section. The Resource Summary for RMO operations for FY05 is depicted in Figure 1-1 of Appendix 1. Out-year resource estimates can be found in Figure 2-3 of Appendix 2.

#### 3.1 AERONAUTICS

SMA support to Aeronautics Technology Programs/Projects will remain the same in FY05. The GRC Aeronautics Technology Business Management System has identified SMA support requirements for the following programs: Aviation Safety (AvSP) program; Airspace Systems (AS) program; and Vehicle Systems (VS) program which includes the Ultra Efficient Engine Technology (UEET), Quiet Aircraft Technology (QAT), and Low Emissions Alternative Power (LEAP) projects.

#### 3.1.1 AVIATION SAFETY and SECURITY (AvSS)

SAAD support to the AvSS Program Office in FY05 will include project assurance, system safety, and (Federal Aviation Administration) FAA liaison. One tenth of a civil servant (0.1 CS), and one-half of a Performance Based Contractor (0.5 PBC) or a total of 0.6 Full Time Equivalents (FTE) will be utilized to support AvSS

#### 3.1.2 VEHICLE SYSTEMS (VS)

- **3.1.2.1** SAAD support to the LEAP project in FY05 will include: project assurance, and risk management. One tenth of a civil servant (0.1 CS) and 25% of a Performance Based Contractor (0.25 PBC), or a total of 0.35 of a Full Time Equivalent will be utilized for LEAP support.
- **3.1.2.2** SAAD support to the Ultra Efficient Engine Technology (UEET) Office in FY05 will include project assurance, risk management, and FAA Liaison support. Ten percent

of a civil servant (0.1 CS) and one-half of a Performance Based Contractor (0.5 PBC), or a total of 0.6 Full Time Equivalents will be utilized for UEET Support.

**3.1.2.3** SAAD support to the Quiet Aircraft Technology (QAT) Engine System Noise Reduction Project will primarily be project assurance. It is anticipated that no more than ten percent (0.1 CS FTE) of a civil servant will be required.

#### 3.1.3 AIRSPACE SYSTEMS PROGRAM (ASP)

SAAD support to the Airspace Systems program is expected to be no more than ten percent (0.1 CS FTE) of a civil servant in FY05.

#### 3.2 SCIENCE

Support in this science area for FY05 has been established at a level of 2 FTE. Support will be provided by a work force comprised of civil servants (1.25 FTE) and contractors (.75 PBC). The Safety and Mission Assurance products and services are mainly in support of the Radioisotope Power System Program which includes the Stirling Radioisotope Generator, and the NASA Evolutionary Xenon Thruster (NEXT) Project.

#### 3.3 EXPLORATION SYSTEMS

Support in the Exploration Systems area for FY05 has been established at a level of ~22 FTE (comprised about equally of civil servants and contractors). SMA support has been identified in the following areas: Exploration Systems Research and Technology, Human Health and Performance, Life Support and Habitation, Mission Operations and Integration, Constellation Systems, and Nuclear Technology and Demonstrations.

#### 3.3.1 HUMAN AND ROBOTIC TECHNOLOGY (H&RT)

SAAD support for H&RT activities is projected to be up to 1.5 FTE civil servant/contractor support. The exact nature of any SAAD support provided will be negotiated with the customer, depending on how the projects are structured. It is expected that some risk management training/facilitation will be required and SAAD support will be required for future technology development proposal development. Also, support will be provided to Headquarters Exploration Systems' formulation activities.

#### 3.3.2 MICROGRAVITY SCIENCE

The Exploration Initiative has had a significant effect on the GRC Microgravity Program, and a number of projects which were focused on basic research have been / will be cancelled or indefinitely postponed. On the other hand, new projects have started or will be getting underway in FY05 which are focused on the applied research needed to support the Exploration Initiative.

SAAD / RMO will be providing resources to support continuing and new Microgravity Science projects in FY05. The customer has estimated a need for approximately 8 FTE Civil Servants (including ~4-5 FTE from Quality Management Office) and approximately 7 FTE contractor personnel.

The Microgravity Research, Development, and Operations Contract (MRDOC), which began in FY00, is expected to continue during FY05. For MRDOC projects, SAAD's role is typically focused on contractor surveillance and independent assessment of contractor deliverables and performance. In FY04, however, some MRDOC projects (e.g., Fluids and Combustion Facility) requested SAAD assume a larger role to supplement contractor activities. SAAD's support for these projects became more like the support given to GRC "in-house" projects, where SAAD has "in-line" product assurance responsibilities.

SAAD plans to support projects in various stages of development during FY05. Greater levels of support will be provided to mature projects in the process of developing flight hardware. However, a low level of concurrent engineering support will also be provided to projects in earlier stages of development (i.e., Phase A/B), in anticipation that these projects will eventually receive authorization to develop flight hardware.

A number of MRDOC and in-house projects are expected to require SAAD support in FY05. Some of these are nearing completion. MRDOC projects include: Fluids and Combustion Facility (FCF), Light Microscopy Module (LMM), Microgravity Droplet Combustion Apparatus (MDCA) / Flame Extinction Experiment (FLEX), and associated fluid physics and combustion science experiments which will be conducted in the LMM and MDCA/FLEX mini-facilities. In addition, there may be several other International Space Station (ISS) payloads, including investigations in the Microgravity Science Glovebox that will require SAAD support. These include the Boiling Experiment Facility (BXF) and the Granular Flow Module (GFM) mini-facility.

In-house projects which SAAD expects to support include: Flow Enclosure Accommodating Novel Investigations in the Combustion of Solids (FEANICS) minifacility, the Microgravity Observations of Bubble Interactions (MOBI) experiment, and newer projects, such as the Two-Phased Flow Facility (TOFFY) and Advanced Human Life Support (AHLS-1, AHLS-2) experiments.

SAAD will work with the customer to help ensure findings from the Columbia Accident Investigation Board (CAIB) Report are addressed. SAAD will collaborate with GRC Engineering, the NASA Engineering and Safety Center (NESC), the Independent Technical Authority (ITA) and the JSC Payload Safety Review Panel (PSRP) to ensure GRC payloads are safe. SAAD will also continue to encourage and support the projects in using continuous risk management techniques to maximize their probability of success.

Finally, in addition to providing overall product assurance guidance and specific "in-line" support to projects, where needed, SAAD will retain the responsibility for independent assessment of flight projects and will provide that assessment to GRC and Headquarters management, as requested.

#### 3.3.3 PROJECT CONSTELLATION

SAAD support at this time to the Space Flight and Exploration Systems Projects Office in FY05 will include: Project Assurance and Risk Management activities. Civil Servant support will be at a level of 1.0 FTE CS and 1.0 FTE PBC. The projects supported will include the Crew Exploration Vehicle and the Vehicle Subsystems Project. As Project Constellation advanced development and studies proceed, it is expected that support will grow in other areas such as space transportation systems, supporting in-space systems, and supporting surface systems.

#### 3.3.4 PROJECT PROMETHEUS

SAAD support in this area is estimated to be 1.5 CS and 1.75 PBC, for a total of 3.25 FTE. The support will primarily be project assurance, risk management, EEE parts assurance, and reliability for the Jovian Icy Moon Orbiter (JIMO) project. It is expected that other opportunities may develop with other nuclear propulsion research and robotic missions in the future.

#### 3.4 SPACE OPERATIONS

Support in the space operations area for FY05 has been established at a level of 0.25 FTE. Support will be provided by a work force comprised of civil servants. The Safety and Mission Assurance products and services are mainly in support of the International Space Station, although some support may also be provided to STS return to flight.

#### 3.4.1 ISS EPS SUBSYSTEM MANAGEMENT

After discussions with the GRC ISS Project Lead, support in this area has been established at a level of 0.25 FTE. The work will be to provide S&MA support to the various ISS EPS Subsystem tasks at GRC on an as needed basis.

#### 3.4.2 STS RETURN TO FLIGHT (RTF)

SAAD will be supporting RTF to the level required by the Project office. The exact nature of any SAAD support will be negotiated with the customer at a later date, depending on how the work is structured.

#### 3.5 ASSURANCE ENGINEERING

#### 3.5.1 ASSURANCE TECHNOLOGY CENTER (ATC)

This initiative provides the infrastructure and resources for the guidance and completion of Agency-wide Safety and Mission Assurance activities as documented in the ATC 3-Year Operating Plan and as specified by the NASA Headquarters Office of Mission Safety & Assurance and the Glenn Research Center Safety and Assurance Directorate. The ATC workforce has been requested to be 2.5 Civil Servants and 25 Work Year Equivalent (WYE) Performance Based Contractors.

#### 3.5.1.1 MISHAP INVESTIGATION PROGRAM

For FY05, a workforce of 0.5 Civil Servants and 6.5 WYE Performance Based Contractors has been specified to support Mishap Investigation activities. These activities will include Enhanced Incident Reporting Information System (IRIS) implementation, IRIS Data Analysis and Countermeasure development, NASA IRIS Users Group support, and NASA Mishap Investigation Working Group support. Mishap Investigation Facilitators development has been proposed to be accomplished under the auspices of the NASA Engineering and Safety Center.

#### 3.5.1.2 EDUCATION & CAREER MANAGEMENT PROGRAM

For FY05, a workforce of 0.2 Civil Servants and 5.1 WYE Performance Based Contractors has been requested to support Education and Career Management activities. These activities will include ongoing development of a comprehensive SMA Training Model, continued evaluation of an SMA Training Management System, and ongoing integration of ATC resources into Agency-wide applications as they are developed.

#### 3.5.1.3 RESEARCH & DEVELOPMENT PROGRAM

For FY05, a workforce of 0.3 Civil Servants and 2.3 WYE Performance Based Contractor has been requested to support the Research and Development (R&D) activities. These activities will include support to Agency-wide conferences and related activities.

# 3.5.1.4 KNOWLEDGE MANAGEMENT PROGRAM/PROCESS BASED MISSION ASSURANCE (PBMA)

For FY05, a workforce of 0.1 Civil Servants and 8.6 WYE Performance Based Contractors has been requested to support the Knowledge Management/PBMA activities. These activities will include maintenance of the ATC data infrastructure and website, distribution of a monthly ATC Newsletter, and day-to-day support, maintenance and update of the Agency-wide PBMA knowledge management system. Development of an Advanced SMA Data Mining Capability/Knowledge Portal has been proposed to be accomplished under the auspices of the NASA Engineering and Safety Center.

#### 3.5.1.5 STRATEGIC MARKETING & MANAGEMENT PROGRAM

For FY05, a workforce of 1.4 Civil Servants and 2.5 WYE Performance Based Contractor has been requested to support the strategic marketing and management activities. These activities will include day-to-day management of all ATC programs & activities, as well as maintenance of a coordinated strategic marketing program across the Agency for ATC activities and promotions/sponsorships.

#### 3.5.2 CENTER SOFTWARE INITIATIVE PROPOSALS (CSIP)

CSIPs are research efforts aimed at advancing the state-of-the-art in software assurance, software management, and software safety. This research is funded by OSMA and managed by the NASA IV&V center. RMO efforts in this area have increased from 3 CSIPs in FY01 to 7 CSIPs in FY04. In FY04, 2 CSIPs will be phased out but the effort on the remaining 5 CSIPs will be at their peak in FY05. The workforce for CSIPs includes 0.5 FTE Civil Servants and 3 FTE Performance Based Contractors for a total of 3.5 FTE.

#### 3.5.3 CENTER TECHNICAL PROGRAM PROPOSALS (CTPP)

CTPPs are also research efforts Aimed at advancing the state-of-the-art in safety and mission assurance tool development and hardware systems. The focus of the NASA funded GRC CTPPs are in the areas of electronic and electrical component research, packaging of electronic devices, probabilistic risk analysis and microsystems. RMO resources in support of the CTPP activity in FY05 include ~2 Civil Servants and ~3 Performance Based Contractors.

NOTE: There were also several additional FY05 CTPPs that were submitted to Headquarters, as well. These were submitted to Headquarters OSMA as "over guideline" CTPPs for GRC. The "over guideline" CTPPs included work for ultra reliability, silicon research, probabilistic risk assessment, and predictive technology for engine research. The workforce support for these "over guideline" CTPPs includes  $\sim 6.5$  Civil Servants and  $\sim 7$  Performance Based Contractors.

# RMO (Risk Management Office) Annual Operating Agreement Elements – FY2005

#### **ACTIVITY DESCRIPTION:**

Managing a safety, mission assurance and risk management program for the GRC Programs and Projects Directorate's activities, particularly projects involved in creating hardware and software to conduct technology development, space flight experiments, and new space power and propulsion systems. Specifically, to provide consultation and support to projects in: Risk management (including CRM training and implementation); system safety; quality assurance and materials and processes (in collaboration with QMO); reliability and maintainability; EEE parts and software assurance.

Goal	Task(s)	Metric (Target)
To reduce risk and assure the safety and success of GRC Programs and Projects Directorate activities	<ol> <li>Provide required risk management, safety and mission assurance support to space experiment flight projects</li> <li>Work with customers, NASA Engineering and Safety Center (NESC), Independent Technical Authority (ITA), JSC Payload Safety Review Panel (PSRP), GRC Engineering, and the SAAD Quality Management Office (QMO) to ensure GRC payloads are safe</li> <li>Complete surveillance annual auditing requirements for MRDOC in collaboration with QMO</li> <li>Distribute customer surveys to the Programs and Projects Directorate Program/Project Managers</li> </ol>	<ol> <li>Percent of successful flight experiments (100%)</li> <li>Percent planned FTE program support per month (90%)</li> <li>Percent of the MRDOC annual surveillance requirements completed (100%)</li> <li>Percent customer satisfaction rating (90%)</li> <li>Programs/projects supported with Project Assurance Plan (PAP) and Risk Management Plan (RMP)activity as requested, to assure project safety and mission success. (100%)</li> </ol>

### ATC (Assurance Technology Center) Annual Operating Agreement Elements – FY2005

#### **ACTIVITY DESCRIPTION:**

The National Aeronautics and Space Administration (NASA) Assurance Technology Center (ATC) assists the Office of Safety and Mission Assurance (SMA) in the management of Agency SMA activities in four broad areas: Education & Career Management; Mishap Investigation; Data Collection and Information Management; and SMA Research/Development.

Goal	Task(s)	Metric (Target)
To reduce risk and assure the safety and success of GRC Programs and Projects Directorate's activities	<ol> <li>Ensure successful support and implementation of the Incident Reporting Information System (IRIS) application which was brought online for the Agency in FY04, including ongoing training, and data analysis and system upgrades as required to enhance Agency-wide usage</li> <li>Continue the development, population and maintenance of the numerous Training &amp; Education web resources enabled through the ATC website (http://atc.nasa.gov), with specific focus on retention of SMA knowledge and competencies</li> <li>Broaden the support to Agency-wide Information Technology- and Knowledge Management-related initiatives, programs and tools through the active incorporation of the Process Based Mission Assurance (PBMA) community, tools and resources into Agency activities, as well as advocacy for new tools being developed throughout the NASA SMA community</li> <li>Actively enhance the Strategic Marketing of SMA expertise, tools and personnel to other Agency organizations so that SMA personnel are effectively utilized in Agency Return-to-Flight and Crew Exploration Vehicle activities, as well as other critical Agency programs</li> </ol>	1. Percent of NASA Centers dynamically linked to IRIS system (100%) 2. Percent of NASA Centers tied into Training &. Education resources on the ATC website (100%) 3. Assurance Technology Symposium and Risk Management Colloquium successfully completed (100%) 4. 10 successfully ATC Training & Marketing Conferences at NASA Centers (90%) 5. Growth in number of website unique visitors by at least 10% per month

### 4.0 QUALITY MANAGEMENT OFFICE (QMO/QV)

The Quality Management Office (QMO) provides Quality Assurance and Quality Management to aeronautics, space research, and technology projects, through the Risk Assessment Office (RMO). This Office also provides Safety and Mission Assurance (SMA) support directly to GRC institutional activities. QMO is directly responsible for Materials and Process Engineering for Space Flight Projects at GRC. The QMO provides expertise in failure analysis of both electronic and mechanical components and systems. The QMO performs internal assessments of the internal quality system and supplies lead and internal auditors to the ISO Project Office. When requested, the QMO supports the GRC ISO 9001 preventative and corrective action system and database.

Although there are several other imbedded quality assurance organizations at GRC, the QMO can provide oversight of these organization as requested. Among these organizations are aircraft maintenance, calibration, contractor oversight of research fabrication and facilities, new construction, and internal inspection within the fabrication facilities.

The key activities and processes of QMO are:

#### **Quality Engineering**

- Lead, Project Mission Assurance
- Project Quality Engineering Support
- Welding Quality Support

#### **Quality Assurance**

- SMA Assessment of Suppliers
- Critical Test and Inspection Validation
- Develop and Implement Quality Activities
- Assessments of GRC, non-SAaD Quality Functions

#### **Quality Management**

- Government-Industry Data Exchange Program (GIDEP)
- Lessons Learned Information System (LLIS)
- Quality Assurance Special Accomplishment Recognition (QASAR) Management
- Manages Materials and Processes and Quality Assurance Functions

#### Materials and Processes

- Maintain Material Intercenter Agreements
- Provide Materials and Processes Engineering for Flight Programs
- Provide Materials and Processes oversight at contractors.

Functional Activity Summaries that detail activity planning are at the end of this section. The Resource Summary for QMO FY05 operations is depicted in Figure 1-2 of Appendix 1. Out-year resource estimates can be found in Figure 2-4 of Appendix 2.

#### **4.1 QUALITY ENGINEERING**

The QMO provides personnel, matrixed through the Risk Management Office (RMO), directly to aeronautics and space flight. QMO provides contract review, specification development, requirements tailoring, general quality expertise, Non-Destructive Engineering (NDE) guidance, fabrication guidance, and processing expertise. In addition, specific, related engineering expertise exists in many specialized fields including: scanning electron microscopy analysis of both electronic and mechanical failures; electronic component design and fabrication; materials selection; materials processing, such as heat treatment, welding, and brazing; and composite fabrication in Kevlar and graphite/graphite.

The critical deliverables for FY05 include:

1. Technical evaluations based on engineering and standard practices

#### **4.2 QUALITY ASSURANCE**

The Quality Assurance activity provides surveys, facility assessments, vendor surveillance, and product oversight, and leads SAAD in implementing ISO within SAAD. The Quality Assurance activity routinely surveys the Center for adequate process management and product assurance controls. QMO can verify that product design requirements are met and can validate testing, critical inspections, and corrective actions. Any number of facility evaluations are performed or verified including: hazard controls, process capabilities, compliance safety, and/or environmental requirements.

The critical deliverables for FY05 include:

- 1. Quality surveys/audits and reports
- 2. Quarterly reports on assistance provided to RMO

#### **4.3 QUALITY MANAGEMENT**

QMO provides several unique quality services. This service includes the *GIDEP*, a NASA/DOD sponsored activity that facilitates the voluntary exchange of technical data related to parts, components, materials, and the Lessons Learned Information System (LLIS), a system that collects and makes available, for whomever may have benefit from the experience of others, the lessons learned from almost forty years in the aeronautics and space business.

The QMO also administers the *QASAR Program*, a program that recognizes accomplishments in quality-assurance disciplines for both civil servants and contractors.

QMO manages the M&P and quality assurance resources of the RMO and reports activities to the 8000 office monthly.

The critical deliverables for FY05 include:

- 1. GIDEP Reports, including analysis, when appropriate
- 2. Quarterly (and Best of the Best annual) QASAR selection and award
- 3. Quarterly LLIS reports on new activities

#### 4.4 MATERIALS AND PROCESSES (M&P)

QMO is responsible for Materials and Processes Engineering at GRC for space flight projects. Materials and Process engineering involves in-house fabrications of flight hardware and evaluation and monitoring of the Materials and Processes Engineering function at contractor facilities.

Materials and Process is a broad discipline that covers many topics including ferrous and non-ferrous metallurgy, non-destructive testing, materials selection, adhesives, plastics, composites, and associated processes such as heat treating, plating, coating, joining, and corrosion control. At NASA there is a substantial area of materials and processes engineering involving oxygen compatibility particularly in high flow rate and at high pressures.

The QMO function generally focuses on materials safety issues: stress corrosion cracking (SCC) susceptibility, general corrosion, outgassing, offgassing, and flammability. Traditionally, Materials Identification and Usage Lists (MIUL) and Materials Usage Agreements (MUA) are managed by this engineering discipline.

For in-house programs, QMO personnel sign all drawings and Engineering Change Orders (ECO). For contracted efforts QMO initially assures that adequate controls exist at the contractors and then monitors the contractor activities to assure Materials and Processes remains in control.

The QMO maintains the Material and Processes (M&P) intercenter agreements.

#### 4.5 QMO METRICS

- 1. Sixty percent QMO Staff "Project Direct"
- 2. Ninety percent of scheduled annual audits completed

#### **ACTIVITY DESCRIPTION: QUALITY ENGINEERING**

Quality Engineering provides contract review, specifications development, requirements tailoring, and general engineering expertise in the following areas: Non Destructive Engineering – selection of appropriate processes; scanning electron microscope – failure analysis and materials identification; welding engineering/quality – lead weld quality effort in concert with engineering; documentation and review for parts or systems in general; recommendations on feasibility, cost, and goodness of design; electronic and electromagnetic components design and fabrication analysis.

Project direct support at 6 FTE 1.) Perform Failure Analysis QMO staff project direct at 6 FTE	Goal	Task(s)	Metric (Target)
2.) Space Projects Safety and Mission Assurance	Project direct support at 6 FTE		QMO staff project direct at 6 FTE

#### ACTIVITY DESCRIPTION: QUALITY ASSURANCE

Quality Assurance activities provide facility assessment, vendor surveillance, and general insight and oversight as an integral part of the quality assurance function in the following areas: Support of the ISO/BMS Process as requested by the ISO Project Office; Maintain GRC's internal assessment system for quality functions; Provide facilities surveys as needed or requested; Validate test, data, or processes; Provide critical inspection verification when requested by the Risk Management Office (RMO) or the Inspection Office; Verify hazard controls when requested by RMO.

Goal	Task(s)	Metric (Target)
1.) Perform all assessments as per schedule	1.) Internal audits for ISO 9000	1.) Number of independent quality assessments of GRC functional areas
2.) Participate in Internal Audits	<ul><li>2.) Facilities surveillance</li><li>3.) Validation and verification</li></ul>	2.) Assigned ISO audits completed

#### ACTIVITY DESCRIPTION: QUALITY MANAGEMENT

Quality Management provides three functions: The Government Industry Data Exchange Program (GIDEP) task monitors and provides a closed loop internal evaluation of active GIDEP Alerts across the GRC; the Lessons Learned Information System (LLIS) reports lessons learned at GRC to the headquarters LLIS data base; and the Quality and Safety Achievement Recognition Awards (QASAR) provides recognition for individuals that have made significant contributions in one of four categories of reporting safety issues in addition to providing a "Best of the Best" award annually.

Goal	Task(s)	Metric (Target)
1.) Assure 100% of the GIDEP alerts are distributed across GRC in a timely fashion	Provide for the distribution of GIDEP across GRC in a closed loop reporting system	1.) 100% of alerts distributed
2.) Develop internal lessons learned for the LLIS system	2.) Provide for the monitoring and reporting of lessons learned for the LLIS system; serve as the GRC contact for LLIS activities	Lessons Learned entered for all completed projects
3.) Provide one award in each of the four categories each quarter	3.) Administer the QASAR Awards program at GRC	3.) Number of QASAR awards submitted per quarter

#### ACTIVITY DESCRIPTION: MATERIALS AND PROCESSES

Quality Management provides Materials and Processes Engineering to Shuttle (STS) and International Space Station (ISS) payloads. Ultimately QMO certifies each payload, as built, for materials design as safe for flight per the authority of intercenter agreements with Johnson Space Flight Center, Marshall Space Flight Center, and Goddard Space Flight Center. The material assessment focuses on Stress Corrosion Cracking, Flammability, Outgassing, and Offgassing assessments. The level of engineering depends on how the packages are contracted. QMO can serve as a direct provider or as simple oversight to a responsible contractor who has demonstrated expertise in space flight materials design.

Goal	Task(s)	Metric (Target)	
1.) Provide safe and efficient materials engineering to all GRC experiments and facilities going to ISS or STS for conformance to materials safety requirements	Evaluate all GRC experiments and facilities going to ISS or STS for conformance to materials safety requirements	1.) 100% of Materials Certifications issued for GRC flight hardware	

## 5.0 GLENN SAFETY OFFICE (GSO/QS)

The Glenn Safety Office (GSO) provides safety engineering and technical support for all Glenn Research Center (GRC) activities. This support is provided based on a comprehensive safety program, defined specifically for GRC. The Program ensures that the Center follows recognized safety codes and standards in all areas of operation, including the modification, construction, or demolition of Center facilities. By fulfilling this role, GRC ensures the implementation of the Agency Safety Initiative (ASI) and the OSHA Voluntary Protection Program (VPP) Certification. The key activities and processes for the Glenn Safety Office are:

## Safety Management

- ASI Implementation
- VPP Implementation
- Safety, Health and Environmental Board
- Labor-Management Safety Board Support
- Document Management
- ISO/BMS Implementation
- Mishap Reporting
- Mishap Investigations
- Safety Training

## Safety Engineering

- Hazard Analysis
- Safety Permit Program Management
- Pressure Systems/Vessels
- Fire Protection/Prevention
- Hydrogen & Oxygen Safety
- Technical Support

## Safety Compliance

- Regulatory Compliance
- Facility Safety Inspections
- Construction Safety Inspections
- Confined Space Entry
- Lockout/Tagout
- Office Safety
- Shop Safety
- Lifting Devices

## **Emergency Preparedness & Response**

- Emergency Preparedness Planning
- Emergency Response
- Medical Response

These programs are described in greater detail in the following sections. Functional Activity Summaries that detail activity planning are at the end of this section. The Resources Summary for GSO FY05 Operations is depicted in Figure 1-3 of Appendix 1. Out-year resource estimates can be found in Figure 2-5 of Appendix 2.

## **5.1 SAFETY MANAGEMENT**

The GSO organization supports Center operations by coordinating day-to-day safety program activities. These activities are related to the implementation requirements of 29 CFR 1960, "Occupational Safety & Health Administration-Basic Program Elements for Federal Employees."

The Safety Program is based on the risk management principles outlined in NASA Procedural Requirements NPR 7120.5. The Safety, Health and Environmental Board (SHEB) defines the guidelines for assessing and accepting risk at GRC. The Glenn Safety Office supports line management in the management of risk at the Center associated with project and program support.

As part of the implementation of ASI, GRC supports the Performance Evaluation Profile (PEP) survey, the main metric that the Agency uses to assess the Safety Program. This is also a primary tool for the implementation of VPP at the Center.

The GSO has assigned a safety point of contact to each Center Directorate to provide safety management information and guidance. The GSO safety point of contact provides a two-way communication path to identify and resolve high level safety concerns within each Directorate.

The GSO provides the following management activities: support to line management for mishap/incident reporting and investigation, tracking and analysis of mishap/incident data, and support to the SHEB and Safety Committees. GSO will continue to support the Incident Reporting Information System (IRIS) upgrades, including training and awareness.

The NASA Safety Reporting System (NSRS) can be used by employees to report unsafe and unhealthy conditions anonymously. The Safety, Health and Environmental Help Line can also be used to report unsafe and unhealthy conditions, as well as concerns and questions. The Glenn Safety Office investigates and responds to each NSRS and Help Line report.

GSO follows the GRC Business Management System (BMS) and ISO 9001 requirements for document management. The primary document that outlines the safety program and meets ISO/BMS requirements is the Glenn Safety Manual. GSO manages the Glenn Safety Manual including development, revision and configuration control.

GSO monitors the Safety Permit Program to ensure that all required documentation meets the criteria specified by ISO 9001 and the Business Management System (BMS). GSO is the repository of all active and expired/terminated permits. These permits contain critical information that includes qualified operators lists, research facility configuration, check sheets, and emergency procedures.

GSO coordinates safety training needs that ensure compliance with all OSHA and NASA requirements. The GSO supports all supervisors in assessing the safety training needs of their personnel. GSO provides safety training, alert bulletins and awareness programs on a variety of safety topics.

This element addresses Core Program Requirements (CPR) 1 and 4 under ASI. This program requirement includes Management Commitment and Employee Involvement (CPR 1) and Safety Training (CPR 4).

The critical deliverables for FY05 include:

- 1. Continue management of the Safety Permit process
- 2. Complete implementation of the IRIS upgrades
- 3. Facilitate completion of the PEP Survey
- 4. Continue Safety Point of Contact program for each Directorate
- 5. Review and modify the Glenn Safety Manual

#### **5.2 SAFETY ENGINEERING**

The Glenn Safety Office's technical support is based on the risk management principles outlined in NPR 7120.5. The individuals in the GSO who provide technical support perform third-party reviews for all on-going facility programs and processes at GRC. Such reviews provide an independent and impartial perspective on technical safety and engineering requirements. The SHEB, the Safety Committees, and the GSO support line management in managing risks at the Center associated with technical support activities.

Safety Committees provide third-party safety reviews to project and program support activities at GRC. A member of the Glenn Safety Office is assigned to each committee. The Aviation Safety Committee reviews the microgravity research projects that will be performed in research aircraft, such as the KC-135.

GSO supports on-going Center activities by supporting all facilities and research operations. It participates in the technical review of safety, engineering and procurement deliverables.

GSO also provides engineering review services in the areas of fire protection, life safety, electrical, mechanical/HVAC, and chemical/process/materials. GSO assists organizations with development of and updates to facility and operational hazard analyses and Job Hazard Analyses (JHA).

This element addresses Core Program Requirements (CPR) 2 and 3 under ASI. These program requirements include Worksite Hazard Analysis (CPR 2) and Hazard Prevention and Control (CPR 3).

The critical deliverables for FY05 include:

- 1. Continue implementation of the Job Hazard Analysis Program
- 2. Continue support for the Safety Committees

#### **5.3 SAFETY COMPLIANCE**

The Glenn Safety Office is involved in technical support activities involving Government and industry codes, regulations, and standards that apply to the technical discipline under consideration. It also provides technical support services like interdisciplinary reviews (procurement deliverables, confined space entry permits, hot work permits, etc.).

Industrial safety activities are based on, but not limited to, the requirements of 29 CFR 1910, "Occupational Safety and Health Standards-General Industry." Facility safety inspections are performed on a quarterly and annual frequency to monitor workplace safety. Assessments of safety programs are performed to ensure that they are compliant with the OSHA standard, to ensure that Center employees are following the programmatic requirements and to identify any opportunities for improvement.

The GSO supports Center construction activities by monitoring day-to-day safety program activities, conducting and coordinating safety training programs, and developing and communicating safety policy. Construction support safety activities are based on, but not limited to, the requirements of 29 CFR 1926, "Occupational Safety and Health Standards-Safety and Health Regulations for Construction."

Construction projects include modification, construction, or demolition of Center facilities. GSO provides the following construction support services: review of Health and Safety Plans, construction safety inspections, and mishap/incident reporting and investigation. Construction safety inspection include, but are not limited to, lockout/tagout, trenching/excavation safety, personal protective equipment, confined space entry, cranes/lifting devices, fall protection, hot work, and electrical safety.

This element addresses Core Program Requirements (CPR) 2 and 3 under ASI. These program requirements include Worksite Hazard Analysis (CPR 2) and Hazard Prevention and Control (CPR 3).

The critical deliverables for FY05 include:

- 1. Verify that all current activities comply with OSHA requirements
- 2. Conduct guarterly and annual facility safety inspections
- 3. Conduct routine construction safety inspections

## 5.4 EMERGENCY PREPAREDNESS AND RESPONSE

The Glenn Safety Office manages the Emergency Preparedness Planning and Response functions for the Center and is responsible for maintenance and revision activities for the Center "Emergency Preparedness Plan." This Plan includes specific guidelines and procedures for different emergencies. One of the sub-elements of the Plan is the Continuance of Operations Plan (COOP), a new requirement within the Agency.

GSO is responsible for responding to emergencies, including medical emergencies. Personnel provide these services 24 hours a day, 7 days a week. This process is outlined in the Center's Emergency Preparedness Plan (EPP).

This element addresses Core Program Requirements (CPR) 1 and 3 under ASI. This program requirement includes Management Commitment and Employee Involvement (CPR 1) and Hazard Prevention and Control (CPR 3).

The critical deliverables for FY05 include:

- 1. Emergency Preparedness Table Top Exercises
- 2. Review and update Building Evacuation Program and Plans
- 3. Develop the GRC Continuance of Operations Plan (COOP)

## 5.5 GSO METRICS

- 1. Percent completion of safety training requirements for civil servants and support service contractors. (⊚≥90%)
- 2. Biennial reviews of GSM chapters completed on time (@=100%)
- 3. PEP Survey completed by September 30, 2005.
- 4. Monthly report of safety statistics / data to senior Center management
- 5. Safety points of contact participation in Directorate safety management activities at least two times per year
- 6. Percent of training completed vs. plan. (@=100%)
- 7. Increase in the number of JHAs in the Center Repository. Baseline is four JHAs.
- 8. NASA / OSHA required programmatic assessments performed. (@=100%)
- 9. Number of Quarterly and Annual Facility Safety Inspections completed vs. scheduled. (@=100%)
- 10. HASPs reviewed in a timely manner. (@=90% reviewed within 5 working day)
- 11. Number of construction safety inspections completed vs. scheduled. (@=100%)
- 12. Percent of Building Evacuation Plan reviews completed. (@=100%)
- 13. Percent of STEEP drills completed. (@=100%)
- 14. Post-incident critiques completed within 10 working days. (@=80%)

**ACTIVITY CATEGORY:** Safety Management

**ACTIVITY DESCRIPTION:** Satisfying safety training elements of pertinent government regulations, agency policies, and adopted guidelines or industry standards.

Goal	Task(s)	Metric (Target ©) (updated quarterly)
Employee training content and periodicity satisfies applicable guidelines, regulations or NASA policy	<ul> <li>Provide and coordinate, or assist with training sessions to provide workers the opportunity to stay compliant with applicable training requirements</li> <li>Review branch or support service contractor training records to assess their training completion status</li> <li>Identify training needs for new activities involving potential safety exposures in the workplace</li> </ul>	% completion of safety training requirements for civil servants and support service contractors (⊚≥90%)

ACTIVITY CATEGORY: Safety Management

**ACTIVITY DESCRIPTION:** Provide safety information to line management and Center employees.

Goal	Task(s)	Metric (Target ⊚) (updated quarterly)
Maintain safety documentation	<ul> <li>Glenn Safety Manual</li> <li>Safety Bulletin</li> <li>PEP Survey</li> <li>Safety records (permits, training, etc.)</li> <li>Meeting minutes</li> <li>SHETC (Safety, Health &amp; Environmental Training Committee)</li> </ul>	<ul> <li>Biennial reviews of GSM chapters completed on time (⊚=100%)</li> <li>PEP Survey completed by September 30, 2005</li> </ul>
Collect, maintain and distribute safety data for Center management	<ul> <li>IRIS Upgrades</li> <li>Incident and Close Call statistics</li> <li>SHEB, Contractor Safety Council, Labor-Management Safety Council, etc.</li> </ul>	Monthly report of safety statistics / data to senior Center management
Directorate access to GSO support	Safety Points of Contact assigned to each Directorate	Safety points of contact participate in Directorate safety management activities at least 2 times per year

**ACTIVITY CATEGORY:** Safety Engineering

**ACTIVITY DESCRIPTION:** Providing safety engineering support to GRC in the areas listed under Tasks. Support may include performing design reviews, providing training, conducting facility inspections, and providing consultation to the GRC community.

Goal	Task(s)	Metric (Target <sup>(a)</sup> ) (updated quarterly)
Manage safety engineering programs for the Center in order to minimize GRC safety liability and risk	Managing the following programs: -Oxygen Safety -Hydrogen Safety -Process Systems & Structural Safety -Electrical Systems Safety -Fire Protection -Job Hazard Analysis -Facility / Operational Hazard Analysis	<ul> <li>Percent of training completed vs. plan. (⊚=100%)</li> <li>Increase in the number of JHAs in the Center Repository. Baseline is 4 JHAs</li> </ul>

**ACTIVITY CATEGORY:** Safety Compliance

**ACTIVITY DESCRIPTION:** Managing a range of safety compliance programs, specifically the programs listed under the task section. Management of these programs includes issuing required permits, providing consultation to the GRC community on compliance issues, monitoring compliance with OSHA regulations, reviewing documents for accuracy and completeness, and providing training to the GRC staff.

Goal	Task(s)	Metric (Target ©) (updated quarterly)
Manage safety compliance programs for the Center in order to minimize GRC safety liability and risk	Managing the following programs:  -Lockout / Tagout  -Confined Space Entry  -Fall Protection  -Digging, Trenching, & Excavation  -Hot Work Authorization  -Cranes and Lifting Devices  -Shop Safety  -Personal Protective Equipment  -Safety Barricades	<ul> <li>NASA / OSHA required programmatic assessments performed (@=100%)</li> <li>Number of Quarterly and Annual Facility Safety Inspections completed vs. scheduled (@=100%)</li> </ul>
Influence the design and implementation of construction projects to address potential safety issues and establish effective controls	<ul><li>Review Health and Safety Plans (HASPs)</li><li>Perform construction safety inspections</li></ul>	<ul> <li>HASPs reviewed in a timely manner. (@=90% reviewed within 5 working days)</li> <li>Number of construction safety inspections completed</li> </ul>

vs. scheduled. (@=100%)

**ACTIVITY CATEGORY:** Emergency Preparedness and Response

**ACTIVITY DESCRIPTION:** Managing the GRC Emergency Preparedness Program. Management of this Program includes response planning, coordination with local emergency response organizations, training, drills and exercises, responding to emergency situations, and conducting post-incident critiques.

Goal	Task(s)	Metric (Target ©) (updated quarterly)
Manage the Emergency Preparedness Program for the Center in order to minimize impact to personnel, facility and equipment damage and operational delays.	<ul> <li>Maintain the Emergency Preparedness Plan</li> <li>Coordination with local emergency response organizations</li> <li>Pre-fire planning</li> <li>Emergency evacuation training and drills (STEEP drills)</li> <li>Conduct emergency response drills</li> <li>Perform annual review of all Building Evacuation Plans</li> <li>Respond to all emergency incidents</li> <li>Conduct post-incident critiques</li> <li>Complete the Continuance of Operations Plan</li> </ul>	<ul> <li>Percent of Building Evacuation Plan reviews completed (@=100%)</li> <li>Percent of STEEP drills completed. (@=100%)</li> <li>Post-incident critiques completed within 10 working days. (@=80%)</li> </ul>

## 6.0 ENVIRONMENTAL MANAGEMENT OFFICE (EMO/QO)

The Environmental Management Office (EMO) supports the GRC mission by fostering a safe and healthful workplace for its employees and ensures that operations are protective of the community and the environment. EMO provides programs and processes at Lewis Field and Plum Brook Station that help Center personnel

- Protect the safety and health of employees
- Protect the environment and surrounding communities
- Ensure the Center meets safety, health, and environmental requirements
- Reduce risk and minimize liability.

Within the EMO organization programs and processes are aligned under three groups: Environmental, Occupational Health, and Resource Management.

## **6.1 FOCUS AREAS**

EMO provides key programs and processes that focus on prevention, compliance, restoration, and conservation:

- Prevention focuses on preventing harm to employees and the environment.
   Preventing harm to employees means employees are productive and contribute to the NASA mission and their communities. Preventing harm to the environment means we protect and preserve the earth for future generations by operating in a sustainable manner.
- Compliance means that current and future operations comply with all safety, health
  and environmental regulations. By complying with requirements the Center is seen as
  a good citizen and legal actions do not interfere with achieving our mission.
  Regulations change constantly and EMO is proactive in monitoring changing
  requirements and modifying Center programs to ensure compliance.
- Restoration focuses on repairing damage created by past activities and cleaning up contamination that could harm the environment, the public, and employees.
- Conservation involves being good stewards of all our resources. It includes careful
  planning of land use, enhancing existing natural resources, and protecting cultural
  resources associated with significant aspects of our historic and prehistoric heritage.
  Conservation also includes programs, like recycling, that reduce the impact of our
  activities on the environment.

### 6.2 PROGRAMS AND PROCESSES

The EMO Environmental Group provides programs and processes devoted to:

- Environmental Management. Supports program and projects by helping
  managers identify and mitigate environmental impacts from early planning
  through execution. Maintains programs that ensure activities conducted at the
  facility are accomplished in compliance with Federal, State, and local
  environmental regulations. This includes managing the Center's air permit, water
  permit, storm water pollution prevention, above and under ground storage tanks,
  and environmental remediation programs.
- Chemical Management. Programs assist chemical users with the acquisition, transportation, handling, use, and storage of chemicals and chemical products while ensuring all regulatory requirements are met. This includes maintaining an inventory of chemicals to meet federal reporting and hazard communication requirements for hazardous materials, and supporting development of standard operating procedures for laboratory chemical use.
- Waste Management. Processes designed to ensure proper management of solid, hazardous, and medical wastes, ensuring compliance with all Federal and State laws and regulations. Provides support services in waste disposal, recycling, and pollution prevention.
- Chemical Sampling and Analysis. Provides chemical sampling and analysis services and expert consulting. Services include sampling and chemical analysis of water, soil, fuels, oils, paint, and insulation materials.

The EMO Occupational Health Group provides programs and processes devoted to:

- Industrial Hygiene and Health Physics. Supports program and projects by helping managers anticipate, identify, evaluate, and control chemical, biological, and physical occupational health hazards. Provides technical guidance needed to ensure safe operations involving chemicals and hazardous materials, ionizing and non-ionizing radiation sources, electromagnetic fields, and radio frequency generators.
- Medical Services. Provides occupational medicine, fitness, and health promotion programs to ensure employee health and well being. This includes medical surveillance programs for respirator users, laser operators, and employees exposed to hazardous materials and noise. The Medical Services function provides for the operation of a comprehensive Medical Center and a Fitness Center. Additionally, the Center Worker's Compensation Program is administered within this function. Claims are managed and integrated using the medical and fitness assets to provide maximum employee benefit.

The EMO Resource Management Group provides programs and processes devoted to:

 Maintaining the Center's ISO 14001 registered Environmental Management System. Glenn Research Center's ISO 14001-compliant Environmental Management System provides the organizational infrastructure for achieving the Center policy to operate in a manner that preserves and protects the environment through pollution prevention, the continual improvement of operations, and compliance with regulations.

- Pollution Prevention and Sustainability. EMO manages a Pollution Prevention
   (P2) and Sustainability program with the goal of reducing use of hazardous
   materials and the generation of waste, conserving natural resources, operating
   in a sustainable manner, reducing environmental impacts, and pursuing other
   projects or activities that promote sustainability at GRC. The P2 effort is lead by
   a P2 Committee with membership from multiple organizations. Working with
   customers and stakeholders, the Committee identifies and evaluates pollution
   prevention opportunities, assisting in the implementation of opportunities that
   have merit, and advocates for funding to support P2/Sustainability projects.
- Outreach.EMO "Outreach" programs are intended to educate, inform, and provide a means for a public interchange of ideas and concerns about NASA projects, occupational health, and the environment. The main outreach organization for the EMO is the Outreach Committee. The main public outreach arm of the Outreach Committee is the NASA Glenn Earth Day Committee, chartered to educate and provide awareness in the areas of occupational health and the environment. It includes activities that highlight the environment and environmental accomplishments at GRC, Plum Brook Station, and within NASA.

Detailed activities associated with these key programs and processes are at the end of this section. Resources requirements for these activities for FY 05 are summarized in Figure 1-4 of Appendix 1. Out-year resource estimates can be found in Figure 2-6 of Appendix 2.

### 6.3 EMO METRICS

- 1. Zero non-compliances with environmental permits, licenses, and regulations
- 2. 100% completion of full or interim corrective actions from facility inspections within 90 days
- 3. 100% Accomplishment of Center-wide environmental objectives and targets (http://smad-ext.grc.nasa.gov/emo/EMS/Targets.PDF)

## EMO Environmental Annual Operating Agreement Elements – FY2005

#### **ACTIVITY DESCRIPTION:**

Managing a range of environmental compliance programs, specifically the programs listed under the task section. Management of these programs includes obtaining required permits, providing consultation to the GRC community on compliance issues, reviewing documents for accuracy and completeness, submitting regulatory reports, tracking excursions and non-compliances, and providing training to the GRC staff.

Goal	Task(s)	Metric (Target ⊚) (updated quarterly)
Manage environmental compliance programs for the Center in order to minimize GRC environmental liability and risk	Managing the following programs:  -Air Emissions  -Wastewater -Stormwater -Soils -Aboveground Storage Tanks/Underground Storage Tanks -Historic Preservation -NEPA -Threatened and Endangered Species -PCBs -Cultural and Natural Resources -Environmental Release Response -Hazardous Waste	<ul> <li>Regulatory required reports submitted on time.(©=100%)</li> <li>Regulatory required plans and documents updated on time (©=100%)</li> </ul>

## **ACTIVITY DESCRIPTION:**

Restoration projects include remedial action at GRC, remediation of underground storage tank sites at Plum Brook, and characterization and disposal of cyclotron beam collimating tips and other miscellaneous equipment/parts activated by cyclotron operation. Funding is from the Environmental Compliance and Restoration portion of the CoF program. It must be noted that remediation schedules and budget are driven by Ohio EPA requirements and are not under direct Center control. Costs, schedule, and report requirements may change during the remediation process.

	Goal	Task(s)		Metric (Target ©) (updated quarterly)
1 2	Obligate 80% of funding     Optimize ECR funds     earmarked for radioactive     source and RAM disposal	<ol> <li>Complete feasibility studies</li> <li>Prepare remedial design</li> <li>Contract for remedial action</li> <li>Support Plum Brook Reactor decontamination and decommissioning effort</li> <li>Asbestos abatement process</li> <li>Noise abatement process</li> <li>Lead paint abatement process</li> <li>Radiological characterization of miscellaneous equipment, materials, etc., used in support of the cyclotron and beam room facilities. Disposal of unwanted</li> </ol>	1. 2. 3.	Dollar amount reduction in the environmental liability (measured annually) Percent of unwanted sources or RAM disposed or funded for disposal Number of activated cyclotron components characterized for disposal
		radioactive sources and other radioactive materials		

## EMO Chemical Management Annual Operating Agreement Elements – FY2005

## **ACTIVITY DESCRIPTION:**

Satisfying chemical management elements of pertinent government regulations and agency policies and supporting EMS objective to reduce the likelihood of chemical spills.

Goal	Task(s)	Metric (Target <sup>(a)</sup> ) (updated quarterly)
Maintain a site-wide inventory of hazardous chemical containers	<ul> <li>Review and release all hazardous chemical purchases requisitioned through the IFMP</li> <li>Provide bar codes to incoming hazardous chemical containers</li> <li>Remove from inventory containers processed by the Waste Management Team</li> <li>Update inventory from input provided by chemical users (Form NASA-C-3032)</li> <li>Conduct periodic building audits to verify accuracy of chemical inventory</li> <li>Resolve inventory discrepancies to 100% accuracy</li> </ul>	Average number of chemical container discrepancies from initial building inventory audits measured against the total chemical containers in the inventory for those buildings (@≤10%)
Manage OSHA Hazard Communication Standard Compliance Program for GRC	<ul> <li>Review Hazard Communication (HAZCOM) Policy and HAZCOM Program on an annual basis</li> <li>Provide container HAZCOM labels upon request</li> <li>Update electronic MSDS database upon receipt of new MSDSs</li> <li>Provide paper copies of MSDSs upon request</li> </ul>	Respond to all customer requests within two business days (@=100%)

## **ACTIVITY DESCRIPTION:**

Satisfying chemical management elements of pertinent government regulations and agency policies and supporting EMS objective to reduce the likelihood of chemical spills.

Goal	Task(s)	Metric (Target <sup>(a)</sup> ) (updated quarterly)
Manage OSHA Chemical Hygiene Standard Compliance Program for GRC	<ul> <li>Review Chemical Hygiene Policy (CHP) and Chemical Hygiene Plan on an annual basis</li> <li>Revise Standard Operating Procedures (SOPs) upon request or prior to expiration</li> <li>Create SOPs upon request</li> </ul>	<ul> <li>SOP reviews will be conducted at a rate of 5 per month (@=100%)</li> <li>Respond to all customer requests within two business days (@=100%)</li> </ul>
Employee HAZCOM and CHP training content and periodicity satisfies applicable guidelines, regulations, or NASA policy	<ul> <li>Review HAZCOM and CHP training on an annual basis</li> <li>Provide HAZCOM and/or CHP training upon request</li> <li>Schedule periodic training sessions to assure availability of required training to all affected personnel</li> </ul>	<ul> <li>1/3 of NASA civil servant chemical users to receive HAZCOM training each year</li> <li>1/3 of NASA civil servant laboratory personnel covered by SOPs to receive Chemical Hygiene training each year. (@=100%)</li> </ul>
Prepare reports on GRC chemical inventory and releases per EPA requirements	<ul> <li>Prepare SARA 312 inventory report each year</li> <li>Prepare SARA 313 toxic chemical release report each year</li> </ul>	Reports submitted to appropriate agencies on time. (@=100%)

## EMO Waste Management Annual Operating Agreement Elements – FY2005

ACTIVITY DESCRIPTION: PRE	VENTION	
Goal	Task(s)	Metric (Target ⊚) (updated quarterly)
Prevent harm to the environment through continual training in adherence to RCRA guidelines	Provide and conduct annual RCRA training to employees identified as handlers and generators of hazardous waste	95% attendance to scheduled training classes
ACTIVITY DESCRIPTION: CO.	MPLIANCE	
Goal	Task(s)	Metric (Target ©) (updated quarterly)
Zero instances of noncompliance identified through notice of violations or audit findings	<ul> <li>Conduct weekly inspections of less than 90 day accumulation sites;</li> <li>Conduct monthly inspections of satellite accumulation sites;</li> <li>Response to audit findings</li> </ul>	<ul> <li>Documentation of inspections</li> <li>Documentation of responses to audits</li> </ul>
ACTIVITY DESCRIPTION: RES	STORATATION	
Goal	Task(s)	Metric (Target ©) (updated quarterly)
Timely response and cleanup of spills or releases to the environment	<ul> <li>Prompt response to spills or releases as reported to emergency dispatch;</li> <li>Coordination of cleanup efforts through internal processes or through the uses of support contractors</li> </ul>	<ul> <li>Immediate response and support to the Center's First Responders</li> <li>Documentation of cleanup efforts to Center standards</li> </ul>
ACTIVITY DESCRIPTION: CO.	NSERVATION	
Goal	Task(s)	Metric (Target ©) (updated quarterly)
<ul> <li>Reduce solid waste generation</li> <li>Continued improvement to existing reuse and recycling programs</li> </ul>	<ul> <li>Develop construction waste recycling program</li> <li>Quantify recycling goals</li> </ul>	Document % of recycling goal

## EMO Chemical Sampling and Analysis Annual Operating Agreement Elements – FY2005

## ACTIVITY CATEGORY: PREVENTION, COMPLIANCE & RESTORATION

**ACTIVITY DESCRIPTION:** To support Glenn Research Center (GRC), Plum Brook Station (PBS) and the Environmental Management Office (EMO) by providing chemical sampling and analysis services and expert consulting. Services include sampling and chemical analysis of water, soil, fuels, oils, paint, insulation materials, asbestos, etc.

Goal	Task(s)	Metric (Target (updated quarterly)
To demonstrate asbestos identification competency  To demonstrate competency of analytical analysis  To provide analytical results in a timely manner	Provide the following analysis:  • Analyze building materials to determine whether asbestos is present  • Analyze paint samples to determine lead content  • Analyze water samples for wastewater permits  • Analyze oil samples for chlorine and mercury content  • Analyze drinking water for preventative maintenance program  • Support the researchers, GRC and PBS with various chemical sampling and analysis	1. To maintain proficiency rating for NVLAP and AIHA accreditation  2. To maintain proficiency rating for EPA DMR-QA and AIHA ELPAT

## EMO Industrial Hygiene and Health Physics Annual Operating Agreement Elements – FY2005

**ACTIVITY CATEGORY: PREVENTION** 

**ACTIVITY DESCRIPTION:** Working with Center personnel to improve management of occupational health issues.

Goal	Task(s)	Metric (Target (a) (updated quarterly)
Influence the design and implementation of construction projects and research activities to address potential occupational health (OH) issues and establish effective controls	<ul> <li>Provide OH input into proposed activities covered by the Health and Safety Plan (HASP) process, the safety permit process, and research proposal review mechanisms</li> <li>Educate Facilities Division personnel and 8A contractors on pertinent OH issues associated with construction, demolition, and renovation activities.</li> <li>Educate research community on OH requirements associated with their work tasks or projects.</li> </ul>	Number of significant, unanticipated delays in HASP approval due to OH issue(s) per number of HASPs issued. (⊚≤5%)
Reduce the number of OSHA-regulated chemicals used at the Center	Establish a baseline of OSHA-regulated chemical usage across GRC with assistance of the Chemical Management Team and other resources	Running % completion comparing the number of buildings base-lined per established schedule of buildings with known chemical usage (@>90%)

## EMO Industrial Hygiene and Health Physics Annual Operating Agreement Elements – FY2005

	1 8 8	
ACTIVITY DESCRIPTION, Seti		and adopted guidalings on industry standards
Goal	sfying occupational health elements of pertinent government regulations, agency policies  Task(s)	Metric (Target ©) (updated quarterly)
Employee training content and periodicity satisfies applicable guidelines, regulations or NASA policy	<ul> <li>Provide and coordinate, or assist with training sessions to provide workers the opportunity to stay compliant with applicable training requirements.</li> <li>Manage personnel training database taking necessary measures to keep workforce current with their training,</li> <li>Review branch or support service contractor training records to assess their training completion status</li> <li>Identify training needs for new activities involving potential exposures to chemical or physical agents in the workplace</li> </ul>	% completion of OH training requirements for civil servants and support service contractors (⊚≥90%updated annually)
Accurately specify current OSHA and NASA occupational health (OH) program requirements to center personnel	<ul> <li>Identify and communicate OH program requirements associated with center activities to center personnel</li> <li>IHHP team members will peer review other programs to satisfy either annual regulatory review requirements or bi-annual team target periodicity</li> </ul>	Running % completion of reviews completed per number of reviews scheduled (@≥80%)
Employee participation in medical surveillance (including respiratory fit tests) satisfies applicable guidelines, regulations, or NASA policy	<ul> <li>Work with divisions to identify individuals requiring medical surveillance and share this information with Medical Services. Assist Medical Services with medical surveillance issues</li> <li>Where possible, influence and promote workers' participation in medical surveillance programs</li> </ul>	Running % compliance of medical surveillance for hearing conservation and respiratory protection programs (@>90%)
Establish potential occupational health hazards associated with chemical and physical agents and periodically assess effectiveness of controls in place to reduce such hazards	<ul> <li>Conduct respiratory hazard assessments for work activities based upon workers' interviews and worksite evaluation</li> <li>Conduct exposure assessments as needed for chemical and physical agents</li> <li>Conduct annual surveys of process exhaust ventilation systems</li> <li>Conduct bi-annual (and others as needed) sound level surveys of identified "noisy" operations</li> </ul>	Running % completion of scheduled assessments and surveys (@≥90%)
Center uses of ionizing and non- ionizing radiation sources (including lasers) pose minimal hazards to workforce and comply with applicable regulations, standards, and policies	<ul> <li>Ensure audits/reviews conducted of radiation safety program (at least two, with at least one being done by external health physics)</li> <li>Audit 25% of Class 3b and 4 laser safety permits to ensure operators are complying with permit conditions</li> </ul>	Percent completion of scheduled audits. (@≥90%)
Satisfy OSHA General Industry worker protection requirements for asbestos present in buildings at GRC	<ul> <li>Coordinate with PBS health and safety and facilities staff to screen buildings for presumed asbestos containing materials</li> <li>Use signs, labels, and general awareness training to communicate potential asbestos hazard to employees at Lewis Field and PBS</li> </ul>	Running % completion of signage/awareness requirements based upon buildings completed versus those identified in established scheduled. (@≥90%)

## EMO Industrial Hygiene and Health Physics Annual Operating Agreement Elements – FY2005

## **ACTIVITY CATEGORY: RESTORATION**

**ACTIVITY DESCRIPTION:** Coordination or facilitation of efforts geared toward remediation of hazardous building materials and the reduction of legacy radioactive materials and abandoned cyclotron support equipment.

	<del>-</del>	
Goal	Task(s)	Metric (Target (updated quarterly)
<ul> <li>Abatement of lead-based paint</li> </ul>	Coordinate with Facilities Division to integrate abatement activities for building(s)	Percentage of identified priority list items included in
and asbestos-containing material	into CoF projects	CoF project scopes
issues identified in the priority	Perform at least 3 days of on-site radiation safety auditing	(⊚≥75%)
list or associated with scheduled	Chair Decommissioning Safety Committee and hold at least two meetings per year	
renovation/ demolition tasks	• Identify release stream for miscellaneous materials, parts, equipment found in	Running % completed of audit and meeting
Support PBS reactor	Building 140 (average of 100 items per month)	commitments
decommissioning project.		(⊚≥80%)
• Reduce GRC's future liability	Transfer of unused lead shields to facility for re-use	
associated with unused store		Reduce radioactive source inventory.
radioactive sources and materials	Disposal/transfer of 20 unused radioactive sources, including small exempt sources	(©≥25% reduction)
as well as unwanted legacy		
equipment and materials from		
the cyclotron		

## **ACTIVITY CATEGORY: OUTREACH**

**ACTIVITY DESCRIPTION:** Communicate with workforce about occupational health issues and services provided by the Industrial Hygiene and Health Physics Team.

Goal	Task(s)	Metric (Target ©) (updated quarterly)
Improve Center awareness of OH issues in the workplace and services offered by the IHHP team	<ul> <li>Sponsor activity or support such an effort that offers opportunity for OH communication (i.e., safety week, health fair, etc.)</li> <li>Provide monthly OH topic for GRC dissemination via either Center Directors Safety Bulletin or as notice on Today@Glenn</li> <li>Provide customers with opportunity to provide feedback on our services. (Team issues at least 6 per week.)</li> </ul>	Running % completion of monthly publication of OH topic in Today@Glenn (@≥ 90%)

## EMO Occupational Medical Program Annual Operating Agreement Elements – FY2005

## **ACTIVITY DESCRIPTION:**

Working with Medical Services to improve management of occupational medical issues.

Goal	Task(s)	Metric (Target ©) (updated quarterly)
Influence the overall medical and physical condition of GRC employees	<ul> <li>Provides the Health Screening Clinic services, which ensures that all program participants are administered physical examinations annually.</li> <li>Provides Occupational Medicine services, which ensures tha illnesses and occupational injuries, medical surveillance and monitoring, medical emergencies, education, and enhancement programs are conducted in an effective and efficient manner</li> <li>Provides Physical Fitness services, which ensures that the program is conducted in conjunction with the Health Screening Clinic and the Occupational Medicine Office for the purpose of improving participant's fitness for duty</li> <li>Provides Ergonomics services, which ensures that assessments are conducted in ergonomics issues that relate to employees' work areas or processes and provides recommendations to EMO management</li> <li>Administers the Center's Workers Compensation Program, which ensures that federal employees who are injured or killed while performing their jobs are properly provided benefits based upon the Federal Employee's Compensation Act</li> <li>Delegates a COTR to ensure contract compliance. The COTR's primary function will be to monitor the contractor's performance to assure adherence to the statement of work in all areas listed above with the exception of the Workers Compensation Program</li> </ul>	To improve by 10% the individual employee participation in those programs whose overall success depends upon voluntary participation  These programs include, but are not limited to the annual physicals conducted by the Health Screening Clinic and the functions conducted by the Physical Fitness Facility personnel

## **EMO Environmental Management Systems (EMS) Annual Operating Agreement Elements – FY2005**

#### **ACTIVITY DESCRIPTION:**

- Environmental planning to identify environmental aspects and impacts of Center activities; determine regulatory requirements; and, evaluate environmental risk.
- Establishment and tracking of Center-wide environmental objectives and targets.
- Management and implementation of operational controls to minimize environmental impacts.
- Auditing conformance to environmental program and tracking non-conformances to closure.
- Reporting on the status and viability of the EMS to the Safety, Health, and Environmental Board (SHEB).

Goal	Task(s)	Metric (Target ©) (updated quarterly)
All objectives and targets achieved Nonconformances corrected within 90 days 100% of employees trained on EMS Awareness	Task(s)  Environmental planning Determine regulatory requirements Risk assessment Tracking objectives and targets Auditing conformance to EMS Management review of EMS Determine regulatory requirements	Achievement of Center-wide objectives and targets (©=100%)  Time to correct non-conformances (©=100%)  % employees trained
	<ul> <li>Risk assessment</li> <li>Auditing conformance to EMS</li> <li>Ensuring corrective action completed</li> <li>Employee EMS Training</li> </ul>	(⊚=100%)

## **EMO Pollution Prevention (P2) and Sustainability Annual Operating Agreement Elements – FY2005**

## **ACTIVITY DESCRIPTION:**

Activities include working with customers and stakeholders to:

- Reduce the use of hazardous materials and the generation of waste,
- Promote a focus on waste prevention through training and replacing old equipment,
- Promote recycling through implementation and training to capture and divert waste streams and to purchase recycled-content products,
- Conserve natural resources
- Operate in a sustainable manner
- Reduce environmental impacts, including activities contributing to climate changes
- Pursue any other projects or activities that promote sustainability at GRC nationwide and possibly worldwide

Advocate for funding to support projects.

Goal	Task(s)	Metric (Target   ) (updated quarterly)
Identify at least 12 P2/Sustainability targets and achieve 6.	<ul> <li>Identify opportunities</li> <li>Evaluate opportunities</li> <li>Implement opportunities</li> <li>Publicize programs</li> </ul>	6 of 12 identified opportunities achieved. (©=50%)

## EMO Outreach Annual Operating Agreement Elements – FY2005

## **ACTIVITY DESCRIPTION:**

- Plan and implement Earth Day activities
- Administer NASA program and project education activities
- Participate in Speakers Bureau assignments and public requests
- Coordinate joint programs with U. S. EPA and other agencies
- Manage and schedule the Aerospace Environmental Traveling Exhibit Bus
- Publicize Pollution Prevention/Sustainability and other programs
- Promote Safety and Health Week
- Promote America Recycles Day
- Support other related activities

Goal	Task(s)	Metric (Target ©) (updated quarterly)
<ul> <li>To inform and educate the public about GRC's programs and projects, and environmental stewardship due to the direct contributions of the men and women at GRC</li> <li>To inform and educate Center personnel in EMS and VPP as well as their role in achieving environmental objectives and targets</li> <li>To initiate and participatr in projects that benefit health, safety, and the environment</li> </ul>	See "Activity Description," above	<ul> <li>Number and type of events</li> <li>Estimated number of people reached (@=TBD)</li> </ul>

## **GLENN RESEARCH CENTER**

SAAD AOA - FY05

**APPENDIX 1** 

FY05 RESOURCE SUMMARIES

## NASA GLENN RESEARCH CENTER SAFETY AND ASSURANCE DIRECTORATE (8000) SAAD DIRECTORATE OFFICE (Q) FY05 RESOURCE SUMMARY

Figure 1-0

Priority	Activity	Work Process	Minimum Effective CS FTE	CS Labor Cost (\$K)	SSC WYE	Contract Cost Funded by Code Q (\$K)	Contract Cost Funded by Institution (\$K)	Total Contract Costs (\$K) (8+9)	Total CS Labor and Cost (\$K) (6+10)
	SAAD Management Operation								
	COST CENTER	M,A	2.0	316			868	868	1,184
1	CODE AE	M,A	0.1	16			25	25	41
1	CoF MANAGEMENT	M,A	0.1	16				0	16
1	METRICS	M,A	0.1	16				0	16
1	TRAINING	M,A	0.2	32				0	32
1	TRAVEL	M,A	0.1	16			26	26	42
1	PERSONNEL	M,A	1.5	237				0	237
1	CS LABOR	M,A	0.0	0				0	-
	TOTALS		4.1	647	0	0	919	919	1,566

Work Process Key: M=Management A=Administration

**Notes:** Refer to PB Decommissioning for additional FTE

#### NASA GLENN RESEARCH CENTER SAFETY AND ASSURANCE DIRECTORATE RISK MANAGEMENT OFFICE (QE) FY05 RESOURCE SUMMARY

Figure 1-1

Priority	Activity	Work Process	Minimum Effective CS FTE	CS Labor Cost (\$K)	SSC WYE	Contract Cost Funded by HQ OSMA (\$K)	Contract Cost Funded by GRC Programs (\$K)	Total Contract Cost (\$K) (7+8)	Total CS Labor and Contract Cost (\$K) (5+9)
1	AERONAUTICS RESEARCH								
	Aviation Safety Program (AvSSP)	P, S, F	0.10	16	0.50		125	125	141
	Vehicle Systems Program (VSP)								
	Low Emissions Alternative Power (LEAP)	P, RM	0.10	16	0.25		63	63	78
	Ultra Efficient Engine Technology (UEET)	P,F,RM	0.10	16	0.50		125	125	141
	Quiet Aircraft Technology (QAT)	P	0.10	16					16
	Airspace Systems Program (ASP)	P, F, S/W, RM	0.35	55	0.25		63	63	118
	TOTAL AEROSPACE		0.75	118	1.50	0	375	375	493
11	SCIENCE								
	Science								
	In-Space	Α	0.50	79	0.75		113	113	191
	Radioisotope Power Systems (RPS)	R,RM.S.Q	0.75	118	0.75		113	113	231
	James Webb Space Telescope (JWST)	s							
	Earth Sciences (ES)	Α							
	TOTAL SCIENCE		1.25	197	1.50	0	225	225	422
1	EXPLORATION SYSTEMS								
	Research, Technology, and Development								
	Human and Robotic Technology (HRT)	R,RM	1.50	237	0.50		75	75	312
	Microgravity Science (see QMO for additional SSC)	R,RM	4.00	631	3.00		1,050	1,050	1,681
	Capability								
	Project Constellation	A	1.00	158	1.00		150	150	308
	Project Prometheus	P,RM,S,R,Q							
	JIMO	A	1.50	237	1.75		263	263	499
	Nuclear Technology & Demonstration								
	TOTAL EXPLORATION SYSTEMS		8.00	1,262	6.25	0	1,538	1,538	2,800
1	SPACE OPERATIONS								
	International Space Station (ISS)	P.E.Q.S	0.25	39					39
	STS Return-to-Flight								
	Space Communications Data Systems (SCDS)								
	TOTAL SPACE OPERATIONS		0.25	39	0.00	0	0	0	39
1	SAFETY AND MISSION ASSURANCE								
	Assurance Technology Center (ATC)		2.50	395		5,248		5,248	5,642
	Process Based Mission Assurance (PBMA)	Α							
	Center Technical Program Proposals (CTPP)	P. R	2.00	316		244		244	1,072
	Center Software Initiative Proposals (CSIP)	s/v	0.50	79					.,
			2.75	434					
	Continuous Risk Management	RM							
	TOTAL SAFETY AND MISSION ASSURANCE		7.75	1,223		5,491		5,491	6,714
	SUBTOTAL RMO PROGRAMS AND HQ		18.00	2,840	9.25	5,491	2,138	7,629	10,469
1	RMO INDEPENDENT ASSESSMENT								
	NASA GRC Independent Technical Authority (ITA)	A	3.00	473					473
	NASA Engineering and Safety Center (NESC)	Α	1.00	158					158
	TOTAL RMO INDEPENDENT ASSESSMENT	Α	4.00	631					631
	RMO ADMINISTRATIVE PROCUREMENTS	A					27	27	59
	TRAVEL - COST CENTER						20	20	20
							20	20	20
	TRAVEL - CODE Q								
	GRAND TOTAL		22.00	3,472	9	5,491	2,138	7,629	11,179

## Work Process Key: P= Product Assurance S=Safety F= FAA RM= Risk Management

R=Reliability & Maintainability SW=Software Product Assurance Q=Quality Assurance Engineering (see QMO) A=ALL

#### NASA GLENN RESEARCH CENTER

#### SAFETY AND ASSSURANCE DIRECTORATE

## QUALITY MANAGEMENT OFFICE (QV)

## FY05 RESOURCE SUMMARY

Figure 1-2

Priority	Activity	Work Process	Minimum Effective CS FTE	CS Labor Cost (\$K)	SSC WYE	Contract Cost Funded by Code Q (\$K)	Contract Cost Funded by GRC Programs (\$K)	Total Contract Cost (\$K) (7+8)	Total Labor and Cost (\$K) (6+9)
	QUALITY EN	IGINEERING							
1		Aeronautics Research	0.6	95				0	95
1		Science	0.6	95				0	95
1		Exploration Systems	4.5	710	2.5	395		394.5	1,107
1		Space Operations	0.3	47				0	47
		TOTAL QUALITY ENGINEERING	6.0	947	2.5	395	0	395	1,344
	QUALITY AS	SURANCE							
1		Critical Test & Inspection Validation	0.1	16				0	16
1		Maintenance of Quality Management Documentation	0.1	16				0	16
1		SMA Audit of Suppliers	0.1	16				0	16
1		Development & Implemention of Quality Activities	0.1	16				0	16
1		Audits of GRC non-OSAT Quality Functions	0.1	16				0	16
1		TOTAL QUALITY ASSURANCE	0.5	79	0	0	0	0	79
	QUALITY MA	ANAGEMENT							
1		Preventive and Corrective Actions -ISO	0.1	16				0	16
1		QASAR Management	0.1	16				0	16
1		GIDEP	0.1	16				0	16
1		Lessons Learned Database	0.2	32				0	32
		TOTAL QUALITY MANAGEMENT	0.5	79	0	0	0	0	79
	MATERIALS	AND PROCESSES							
1		Exploration Systems	1.0	158	1.5	237	0	237	396
	QMO COST	CENTER ADMINISTRATIVE							
1		Civil Servant Administrative Labor	2.0	316				0	316
1		Civil Servant Travel	0.0	0			15	15	15
1		Administrative Purchases	0.0	0			30	30	
		TOTAL ADMINISTRATIVE	2.0	316	0	0	45	45	361
	FULL COST	TOTAL	10.0	1,578	4	631	45	676	2,258

## NASA GLENN RESEARCH CENTER SAFETY AND ASSURANCE DIRECTORATE GLENN SAFETY OFFICE (QS) FY05 RESOURCE SUMMARY

Figure 1-3

Priority	Activity	Work Process	Minimum Effective CS FTE	CS Labor Cost (\$K)	SSC WYE	Contract Cost Funded by Code Q (\$K)	Contract Costs Funded by Institution (\$K)	Total Contract Cost (\$K) (8+9)	Total Cost (\$K) (6+10)
	SAFETY	MANAGEMENT							
1		Safety Management System	1.5	237	0.1		15	15	
1		VPP Implementation	1.0	158	0.2		20	20	178
1		Document Management	0.5	79	0.1		15	15	94
1		Executive Safety Board	0.5	79	0.1		15	15	
1		Mishap Reporting	0.5	79	0.5		60	60	139
1		Contractor Safety	1.0	158	0.2		25	25	183
1		Area Safety Committee Support	0.5	79	0.2		20	20	99
1		Glenn Safety Manual	0.5	79	0.1		15	15	94
		TOTAL SAFETY MANAGEMENT	6.0	947	1.5	0	185	185	1,132
	SAFFTY	 Engineering							
1	SALLII	Hazard Analysis Program	1.0	158	0.3		30	30	188
1		Pressure Safety	0.5	79	0.4		50	50	129
1		Construction Safety	2.0	316	0.2		20	20	336
1		Fire Protection	1.0	158	0.1		15	15	
1		Safety Permit	1.0	158	0.4		50	50	208
1		Mishap Investigation	0.5	79	0.7		25	25	104
'		TOTAL SAFETY ENGINEERING	6.0	947	1.6	0		190	1,137
	SAEFTY	COMPLIANCE							
1	SALLII	Safety Training	1.0	158	0.3		40	40	198
1		Emergency Response	2.0	316	0.1		15	15	
<u> </u>		Emergency Preparedness	1.0	158	0.1		30	30	188
1		Facilities Inspection	1.0	158	0.6		80	80	238
1		Regulatory Compliance	1.0	158	0.5		60	60	218
1		Lifting Devices	1.0	158	0.3		16	16	174
<u> </u>		TOTAL SAFETY COMPLIANCE	7.0	1,105	1.9	0		241	1,346
	CAFETT:	ADMINISTRATIVE							
	SAFETY	ADMINISTRATIVE					5.15		0.10
1		Administrative Procurements					240	240	240
11		Travel					23	23	23
		TOTAL SAFETY ADMINISTRATIVE					263	263	263
	FULL CO	I IST TOTAL	19.0	2,998	5.0	0	879	879	3,877

## NASA GLENN RESEARCH CENTER SAFETY AND ASSURANCE DIRECTORATE ENVIRONMENTAL MANAGEMENT OFFICE (8400)

## FY05 RESOURCE SUMMARY

Figure 14

Priority	Activity	Work Process	Minimum Effective CS FTE	CS Labor Cost (\$K)	Other Costs for CS Support (\$K)	PBC Cost (\$K)	Environmental CoF and other Contract Cost (\$K)	Total Contract Cost (\$K) (7+8)	Total Cost (\$K) (5+6+9)
	Environmental								
1		Compliance	10.0	1,578	65	1,489	500	1,989	3,632
1		Abatenment	0.0						-
1		Remediation	1.0				2,000	2,000	2,158
1		Outreach	1.0	158		2			158
1		Nets					244	244	244
		TOTAL ENVIRONMENTAL	12.0	1,894	65	1,491	2,744	4,235	6,192
	Occupational Health								
1		Compliance	8.0		70	530		530	1,862
1		Abatenment	1.0		25	150		150	333
1		Remediation	0.0						-
1		Outreach	1.0			4		4	162
1		Medical Services and Fittness Center	1.0			1,285		1,285	1,443
		EAP	1.0	158		22		22	180
		TOTAL OCCUPATIONAL HEALTH	12.0	1,894	95	1,991		1,991	3,980
	THO C LOW C								
1	EMO General Office Supp	ply Cost			15				15
1	Travel Vehicle cost				29 8				29 8
1	Other services				12			-	12
	Outer services	TOTAL ADMINISTRATIVE COST			64			-	64
		GRAND TOTAL	24.0	3,787	224	3,482	2,744	6,226	10,235

# SAFETY AND ASSURANCE DIRECTORATE PLUMBROOK DECOMMISSIONING OFFICE (QD) FY05 RESOURCE SUMMARY

Figure 1-5

Priority	Activity	Work Process	Minimum Effective CS FTE	CS Labor Cost (\$K)	SSC WYE	Environmental CofF Contract Cost (\$K)	Other Contract Cost (\$K)	Total Contract Cost (\$K) (7+8)	1
1	Plumbrook Reactor Decommissioning *	M,A	2.9			30,500		30,500	30,500
1	CS Administrative Travel	M,A	Ü				17	17	17
	TOTALS					30,500	17	30,517	30,517

**Work Process Key:**M=Management
A=Administration

Enterprise Customer Key:

J=Management Systems

Notes:

<sup>\*</sup> Refer to Figure 2-5 (EMO) for 1 additional FTE

## **GLENN RESEARCH CENTER**

SAAD AOA - FY05

**APPENDIX 2** 

FY05 OUT YEAR RESOURCES

#### NASA GLENN RESEARCH CENTER

#### SUMMARY

#### **OUT-YEAR RESOURCE ESTIMATES**

Figure 2-0 ACTUALS FOR FY 2004 PLAN FOR FY 2005 OUTYEAR FY 2006 OUTYEAR FY 2007 OUTYEAR FY 2008 OUTYEAR FY 2009 FUNDING FUNDING FUNDING FUNDING FUNDING FUNDING ACTIVITY CS CS CS CS CS CS PROG & PROG & PROG & INST PROG & HQ TOTAL INST HQ TOTAL INST HQ TOTAL INST HQ TOTAL INST PROG & HQ TOTAL INST PROG & HQ TOTAL SAAD DO 1,673 1,698 1,541 1,566 1,583 1,608 4.1 1,626 1,651 1,672 1,697 1,719 1,744 43,400 43,417 30,500 30,517 10,221 10,238 1,867 1,884 PBDO 18.0 RMO 8,417 8,496 22.0 552 10,627 11,179 22.0 561 10,839 11,401 22.0 571 11,056 11,627 22.0 581 11,277 11,858 22.0 591 11,503 12,094 10.0 1,740 10.0 10.0 QMO 517 1,630 2,147 10.0 518 2,258 10.0 528 1,774 2,302 10.0 538 1,810 2,348 547 1,846 2,394 557 1,883 2,441 GSO 17.0 4,052 3,499 3,499 19.0 3,877 3,877 19.0 3,896 3,896 19.0 3,975 3,975 19.0 4,052 19.0 4,136 4,136 24.0 2,744 EMO 7,214 2,130 9,344 24.0 7,491 10,235 24.0 7,503 2,795 10,298 24.0 7,674 2,765 10,439 24.0 7,873 2,775 10,648 24.0 8,076 2,785 10,861 GRAND TOTAL 77.0 12,999 55,602 68,601 82.0 13,997 45,635 59,632 82.0 14,087 25,655 39,742 82.0 14,400 17,523 31,923 79.0 14,725 15,923 30,648 79.0 15,080 31,276

## NASA GLENN RESEARCH CENTER

#### FUND SOURCE SUMMARY

#### OUT-YEAR RESOURCE ESTIMATES

Figure 2-1

			ACTUAL	FOR FY 200	4		PLAN F	OR FY 2005			OUTYE	AR FY 2006			OUTYEA	AR FY 2007			OUTYE	AR FY 2008			OUTYE	AR FY 2009	
			FUN	DING (\$K)			FUNI	DING (\$K)			FUN	DING (\$K)			FUND	ING (\$K)			FUND	ING (\$K)			FUNI	DING (\$K)	
ACTIVITY	WORK PROCESS	cs		\$																					
			INST	HQTS	TOTAL																				
OPERATIONS																									
	CODE Q	5.1		5,192	5,192	7.8		6,714	6,714	7.8		6,848	6,848	7.8		6,985	6,985	7.8		7,125	7,125	7.8		7,267	7,267
									,																
	COST CENTER	47.9	12,869		12,869	51.9	13,867		13,867	51.9	13,957		13,957	51.9	14,270		14,270	51.8	14,595		14,595	51.8	14,950		14,950
	TRAVEL	0.1	130		130	0.1	130		130	0.1	130		130	0.1	130		130	0.1	130		130	0.1	130		130
	INOVEL	0.1	130		130	0.1	130		130	0.1	130		130	0.1	130		130	0.1	130		130	0.1	130		130
	CODE AE	0.1		25	25	0.1		25	25	0.1		25	25	0.1		25	25	0.1		25	25	0.1		25	25
	CoF	3.9		45,295	45,295	4.9		33,000	33,000	4.9		12,761	12,761	4.9		4,367	4,367	2.0		2,500	2,500	2.0		2,500	2,500
	NETS	0.0		235	225	0.0		244	244	0.0		255	255	0.0		265	265	0.0		275	275	0.0		285	285
	NE15	0.0		235	235	0.0		244	244	0.0		255	255	0.0		205	205	0.0		2/5	2/5	0.0		205	205
	PROGRAM FUNDED	19.9		4,855	4,855	17.3		5,652	5,652	17.3		5,765	5,765	17.3		5,881	5,881	17.3		5,998	5,998	17.3		6,118	6,118
GRAND TOTAL		77.0	12,999	55,602	68,601	82.0	13,997	45,635	59,632	82.0	14,087	25,655	39,742	82.0	14,400	17,523	31,923	79.0	14,725	15,923	30,648	79.0	15,080	16,196	31,276

#### NASA GLENN RESEARCH CENTER

#### DIRECTORATE OFFICE

#### OUT-YEAR RESOURCE ESTIMATES

Figure 2.3

			Д	CTUAL I	OR FY	2004		PLAN F	OR FY 2	005		PLAN FO	R FY 2006			PLAN F	OR FY 2007	7		PLAN F	OR FY 200	8		PLAN	FOR FY 20	)09
				FUN	IDING			FU	NDING			FUN	IDING			FUI	NDING			FU	NDING			F	UNDING	
Priority	ACTIVITY	WORK PROCESS	cs		\$		cs		\$		cs		\$		cs		\$		cs		\$		cs		\$	
				INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL
SAAD DII	RECTORATE OFFICE																									
1	COST CENTER	M,A	3.0	850		850	2.0	868		868	2.0	897		897	2.0	927		927	2.0	959		959	2.0	993		993
1	CODE AE	M,A	0.1		25	25	0.1		25	25	0.1		25	25	0.1		25	25	0.1		25	25	0.1		25	25
1	C of F	M,A	0.1			0	0.1			0	0.1			0	0.1			0	0.1			0	0.1			0
1		M,A	0.1			n	0.1			0	0.1			n	0.1			n	0.1			n	0.1			n
1		M,A	0.2			0				0	0.2			n	0.2			n	0.2			n	0.2			0
1		M,A	0.1	26		26		26		26		26		26		26		26	0.1	26		26	0.1	26		26
1			1.5	26				20		20	1.5	26		20		26		20	1.4	26				26		26
		M,A	1.5	707				0.47		0.47	1.5			000	1.5	070		070	1.4	207		- ŭ	1.4	700		700
1	CS LABOR	M,A		797		797		647		647		660		660		673		673		687		687		700		700
	TOTALS		5.1	1,673	25	1,698	4.1	1,541	25	1,566	4.1	1,583	25	1,608	4.1	1,626	25	1,651	4.0	1,672	25	1,697	4.0	1,719	25	1,744

#### Work Process Key:

M = Management

A = Administrative

## SAFETY AND ASSURANCE DIRECTORATE (Q) NASA GLENN RESEARCH CENTER RISK MANAGEMENT OFFICE (QE) OUT-YEAR RESOURCE ESTIMATES

ACTIVITY  AFRONAUTICS RESEARCH Aviation Safety and Security Program (AvSSP) Vehicle Systems Program (VSP) Low Emissions Alternative Power (LEAP) Ultra Efficient Engine Technology (UEET) Quiet Aircraft Technology (OAT) Airspace Systems Program (ASP) Space Launch Initiative (SLI) Next Generation Launch Technology (NGLT) Orbital Space Plane (OSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	WORK PROCESS  P.S.F  P.RM P.F.RM P.F.RM P.P.M.S.Q.R  P.RM.S.Q.R  P.RM.S.Q.R  A  R.RM  A  R.RM A  R.RM A  R.RM A	0.10 0.10 0.10 0.75 0.10 0.50 0.10 0.75 2.50	(\$K) INST	ALS FOR I FUNDING (\$K) PROG 16 16 16 177 16 278.1 16 177	(\$K) HQTS	16 16	0.35	(\$K)	AN FOR F FUNDIN PROG 141 78 141 16 118		78 141	0.10 0.10 0.10 0.10 0.35	(\$K) INST	144 80 144		80	0.10 0.10	(\$K) INST	AN FOR F FUNDIN PROG 146		81	0.10 0.10	(\$K) INST F	149		83	0.10 0.10 0.10	(\$K)		(\$)	152 85 152
ARRONAUTICS RESEARCH Aviation Safety and Security Program (AvSSP) Vehicle Systems Program (NSP) Low Emissions Alternative Power (LEAP) Ultra Efficient Engine Technology (DEET) Quiet Aircraft Technology (DAT) Airspace Systems Program (ASP) Space Launch Initiative (SLI) Next Generation Launch Technology (NGLT) Orbital Space Plane (DSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (MST)	PROCESS  P.S.F  P.RM P.F.RM P.P  P.F.SAWRM  P.RM.S.Q.R P.RMS R.RM  R.RM  A  R.RMS,Q.S	0.10 0.10 0.10 0.75 0.10 0.50 0.50 0.75	(\$K) INST	(\$K) PROG 16 16 16 177 16 278.1 16 177	(SK) HQTS	16 16 16 16 0 0 0 177 16 278	0.10 0.10 0.10 0.10 0.10 0.35		PROG 141 78 141 16	(\$)	78 141 16	0.10 0.10 0.10 0.10		PROG 144 80 144	(\$)	144	0.10		PROG 146	(\$)	146	0.10		PROG 149	(\$)	149	0.10 0.10 0.10		PROG 152 85 152 17		152
AERONAUTICS RESEARCH Aviation Safety and Security Program (AvSSP) Vehicle Systems Program (NSP) Love Emissions Alternative Power (LEAP) Ultra Efficient Engine Tachology (DEET) Outel Aircraft Technology (DAT) Airspace Systems Program (ASP) Space Launch Initiative (SI) Next Generation Launch Technology (NGLT) Orbital Space Plane (OSP) Mission and Science Measurement (MSM) Engineering for Compiles Systems (ECS) Computing, Info. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (MST)	P.S.F P.RM P.F.RM P.F.RM P.F.SW,RM P.F.SW,RM P.RM.S.Q.R P.RM.S.Q.R P.R.RM R.RM R.RM R.RM A R.RM,S.Q.S	0.10 0.10 0.10 0.75 0.10 0.50 0.50 0.75	INST	16 16 16 16 177 16 278.1 177	HOTS	16 16 16 16 0 0 0 177 16 278	0.10 0.10 0.10 0.10 0.10 0.35		78 141 16		78 141 16	0.10 0.10 0.10 0.10		144 80 144		144	0.10		146		146	0.10		149		149	0.10 0.10 0.10		152 85 152 17		152
Aviation Safety and Security Program (AvSSP) Vahicle Systems Program (NSP) Low Emissions Alternative Power (LEAP) Ultra Efficient Engine Technology (DEET) Quiet Aircraft Technology (DAT) Airspace Systems Program (ASP) Space Launch Initiative (SLI) Next Generation Launch Technology (NGLT) Orbital Space Plane (DSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (MST)	P.RM P.F.RM P.F.RM P.F.S.W.RM P.RM.S.Q.R P.RM.S.Q.R P.R.RM R.RM R.RM	0.10 0.10 0.75 0.10 0.50 0.10 0.75		16 16 16 177 16 278.1 16 177		16 16 16 0 0 177 16 278	0.10 0.10 0.10 0.35	IKS1	78 141 16	IIQ13	78 141 16	0.10 0.10 0.10	III	144 80 144	IIQIS	144		mor	146	IIQIS	146		III-31	149	IIQIS	149	0.10 0.10 0.10		152 85 152 17	IIQ13	152 85
Vehicle Systems Program (VSP) Lov Emissions Attenative Power (LEAP) Ultra Efficient Engine Technology (UEET) Outer Aurora Technology (AD) Airspace Systems Program (ASP) Space Launch Initiative (SU) Next Generation Launch Technology (NGLT) Orbital Space Plane (OSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (MST)	P.RM P.F.RM P.F.RM P.F.S.W.RM P.RM.S.Q.R P.RM.S.Q.R P.R.RM R.RM R.RM	0.10 0.10 0.75 0.10 0.50 0.10 0.75		177 16 278.1 16 177		16 16 0 0 177 16 278 16	0.10 0.10 0.10 0.35		78 141 16		78 141 16	0.10 0.10 0.10		80 144		80					81			83		83	0.10 0.10		85 152 17		85
Vehicle Systems Program (VSP) Love Emissions Attensive Power (LEAP) Ultra Efficient Engine Technology (UEET) Outer Attensit Engine Technology (UEET) Airspace Systems Program (ASP) Space Launch Initiative (SU) Next Generation Launch Technology (NGLT) O'bital Space Plane (OSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Inde. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (MST)	P,F,RM P P,F,S,W,RM P,RM,S,Q,R P,RM,S,Q,R P,R,RM R,RM R,RM R,RM	0.10 0.75 0.10 0.50 0.10 0.75		177 16 278.1 16 177		16 0 0 177 16 278 16	0.10 0.10 0.35		141 16		141 16	0.10		144			0.10		81			0.10					0.10		152 17		85
Ultra Efficient Engine Technology (UEET) Outel Arrart Technology ((JAT) Airspace Systems Program (ASP) Space Launch Initiative (SL) Next Generation Launch Technology (NGLT) Orbital Space Plane (USP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	P,F,RM P P,F,S,W,RM P,RM,S,Q,R P,RM,S,Q,R P,R,RM R,RM R,RM R,RM	0.10 0.75 0.10 0.50 0.10 0.75		177 16 278.1 16 177		16 0 0 177 16 278 16	0.10 0.10 0.35		141 16		141 16	0.10		144			0.10		81			0.10	-				0.10		152 17		
Quiet Arcraft Technology (OAT) Alrspace Systems Program (ASP) Space Launch Initiative (SLI) Next Generation Launch Technology (NGLT) Orbital Space Plane (OSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	P P,F,SW,RM P,RM,S,Q,R P,RM,S,Q,R P,R,RM R,RM R,RM	0.75 0.10 0.50 0.10 0.75		177 16 278.1 16 177		0 0 177 16 278	0.10 0.35		16		16	0.10														149		$\rightarrow$	17	-	1521
Airspace Systems Program (ASP) Space Launch Initiative (SLI) Next Generation Launch Technology (NGLT) Orbital Space Plane (QSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Ind. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (MST)	P,F,S,W,RM P,RM,S,Q,R P,RM,S,Q,R P,R,RM R,RM R,RM R,RM R,RM	0.10 0.50 0.10 0.75		278.1 16 177		177 16 278 16	0.35										0.10		146		146			149							
Space Launch Initiative (SLI) Next Generation Launch Technology (NSLT) Orbital Space Plane (QSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	P,RM,S,Q,R P,RM,S,Q,R P,R,RM R,RM R,RM A R,RM,S,Q	0.10 0.50 0.10 0.75		278.1 16 177		16 278 16			118		118	0.35		16			0.10		16		16	0.10		17		17	0.10		127	-	17
Next Generation Launch Technology (NSLT) Orbital Space Plane (OSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (MST)	P,RM,S,Q,R P,R,RM R,RM R,RM A R,RM	0.10 0.50 0.10 0.75		278.1 16 177		16 278 16								120		120	0.35		122		122	0.35		125		125	0.35		141		127
Orbital Space Plane (OSP) Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	P,RM,S,Q,R P,R,RM R,RM R,RM A R,RM	0.10 0.50 0.10 0.75		278.1 16 177		16 278 16																									
Mission and Science Measurement (MSM) Engineering for Complex Systems (ECS) Computing, Info. 8. Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (MST)	P,R,RM R,RM R,RM A R,RM,S,Q S	0.50 0.10 0.75		278.1 16 177		278 16																	$\rightarrow$								
Engineering for Complex Systems (ECS) Computing, Info. & Communications Tech Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM R,RM A R,RM,S,Q S	0.10 0.75		16 177		16				_													$\rightarrow$					$\rightarrow$		$\rightarrow$	
Computing, Info. & Communications Tech. Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM R,RM A R,RM,S,Q S	0.10 0.75		16 177		16																	$\rightarrow$				$\rightarrow$				
Enabling Concepts and Technologies (ECT) TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM A R,RM,S,Q S	0.75	0	177			1																	$\longrightarrow$			$\rightarrow$				
TOTAL AERONAUTICS RESEARCH  SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	A R,RM,S,Q S		0		0	177																$\overline{}$	$\rightarrow$	$\rightarrow$		$\longrightarrow$	$\rightarrow$			$\rightarrow$	
SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM,S,Q S	2.50	0	711	0																	$\overline{}$		$\rightarrow$			$\rightarrow$				
SCIENCE Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM,S,Q S	2.50	U	/11	U		0.75	_	100			0.75				500	0.75			_	F.10	0.75					0.70	_	F0.4		
Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM,S,Q S					711	0.75	0	493	- 0	493	0.75	0	503	0	503	0.75	0	513	0	513	0.75	0	524	0	524	0.75	- 0	534	0	534
Science In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM,S,Q S																									$\vdash$					
In-Space Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM,S,Q S						$\vdash$																$\rightarrow$	$\rightarrow$		-	-	-	$\rightarrow$	-	-
Radioisotope Power Systems (RPS) James Webb Space Telescope (JWST)	R,RM,S,Q S					-	0.50		101		101	0.50		407		105	0.50		400		199	0.50	$\rightarrow$	202		202	0.50		207	$\rightarrow$	207
James Webb Space Telescope (JWST)	S					1 0	0.50		191		191			195			0.50		199				-	203		203	0.50		207	_	207
						1 0	0.75		231		231	0.75		236		236	0.75		240		240	0.75	$\rightarrow$	245		245	0.75		250	-	250
	A					1 0																	$\rightarrow$			-	$\rightarrow$	-	_	_	
Earth Sciences (ES)						1																	-				-		_	-	
TOTAL SCIENCE		0.00	-	-	-		1.25		422		422	1.25		431		431	1.25		439		439	1.25	-	448		448	1.25	-	457	-	457
TUTAL SCIENCE		0.00	U	U	U	J U	1.25	U	422	U	422	1.25	U	451	U	451	1.25	U	439	U	439	1.25	U	448	U	446	1.25	U	45/	- 0	45/
EVEL ODATION CUCTEMO																								$\rightarrow$			$\rightarrow$			$\rightarrow$	
EXPLORATION SYSTEMS																						$\rightarrow$	$\rightarrow$	$\rightarrow$			$\rightarrow$	_	-	$\rightarrow$	
Research, Technology, and Development	R.RM						1.50		312		312	1.50		318		318	1.50		324		324	1.50	$\rightarrow$	331		331	1.50	$\rightarrow$	337	-	337
Human and Robotic Technology (H&RT)		0.00		4.000		4.000																	+					$\rightarrow$		-+	
Microgravity Science	R,RM	8.60		1,993		1,993	4.00		1,681		1,681	4.00		1,715		1715	4.00		1,749		1749	4.00	$\rightarrow$	1,784		1,784	4.00	$\overline{}$	1,820	$\rightarrow$	1,820
Capability							1.00		000		220	1.00		044		011	4.00		000		000	1.00	$\rightarrow$	207		007	4.00		200	$\rightarrow$	200
Project Constellation	A			504		0			308		308	1.00		314		314	1.00		320		320	1.00	$\rightarrow$	327	$\overline{}$	327	1.00	$\rightarrow$	333		333
Project Prometheus	P,RM,S,R,Q	1.80		521		521																	$\rightarrow$								
JIMO	A					0	1.50		499		499	1.50		509		509	1.50		519		519	1.50	$\rightarrow$	530		530	1.50		540		540
Nuclear Technology & Demonstration																							$\rightarrow$	$\longrightarrow$			$\rightarrow$	-		-	
TOTAL SUSI OBATION OVOTSMO		40.40		0.544	_	0.544	0.00	-	0.000	-	0.000	0.00	-	0.050	-	0.050	0.00	-	2.042		2.040	0.00	_	0.074		0.074	0.00		0.004	_	0.004
TOTAL EXPLORATION SYSTEMS		10.40	U	2,514	U	2,514	8.00	U	2,800	U	2,800	8.00	U	2,856	U	2,856	8.00	U	2,913	U	2,913	8.00	U	2,971	U	2,971	8.00	U	3,031	U	3,031
CDACE ODERATIONS																						-	$\rightarrow$	$\rightarrow$			$\rightarrow$			$\rightarrow$	
SPACE OPERATIONS	5500					-	0.05					0.05				10	0.05		- 44			0.05	$\rightarrow$				0.05		- 40	$\rightarrow$	
International Space Station (ISS)	P,E,Q,S					U	0.25		39		39	0.25		40		40	0.25		41		41	0.25	$\rightarrow$	41	$\overline{}$	41	0.25		42	$\rightarrow$	42
STS Return-to-Flight					_																	$\rightarrow$	$\rightarrow$	$\rightarrow$			$\rightarrow$		-	$\rightarrow$	
Space Communications Data Systems (SCDS)																							$\rightarrow$	$\rightarrow$			$\rightarrow$	_	-	$\rightarrow$	
TOTAL ORACE OPERATIONS		0.00				0	0.05		20		20	0.00		- 10		- 10	0.25		- 14			0.00	-	- 4	-	- 44	0.05	- 0	(2)	-	- 10
TOTAL SPACE OPERATIONS		0.00	0	0	0	0	0.25	U	39	U	39	0.25	0	40	U	40	0.25	0	41	0	41	0.25	0	41	0	41	0.25	0	42	0	42
CAFETY AND MICCION ACCUDANCE																						$\rightarrow$	$\rightarrow$	$\rightarrow$	$\overline{}$		$\rightarrow$	$\rightarrow$		$\rightarrow$	
SAFETY AND MISSION ASSURANCE		2.00			1.451	1.151	2.50			F.C.(0)	F.C.10	2.50			C 755	E 755	2.50			5.070	E 070	2.50	-	$\rightarrow$	E 007	5.007	2.50			0.407	0.407
Assurance Technology Center (ATC)	A A	2.00 0.50			4,154	4,154	2.50			5,642	5,642	2.50			5,755	5,755	2.50			5,870	5,870	2.50	$\rightarrow$	$\rightarrow$	5,987	5,987	2.50	$\rightarrow$		6,107	6,107
Process Based Mission Assurance (PBMA)	P P				770	770	0.00			4.070	4.070	0.00			4.000	4.000	0.00			4 445	4 445	0.00	$\rightarrow$	$\rightarrow$	1.100	4.400	0.00	$\rightarrow$		1.100	4.400
Center Technical Program Proposals (CTPP)	P, R S/W	0.40			779					1,072	1,072 0				1,093	1,093	2.00 0.50			1,115	1,115	2.00 0.50		$\rightarrow$	1,138	1,138	2.00 0.50			1,160	1,160
Center Software Initiative Proposals (CSIP)	S/W RM	1.70			260	260					U	0.50 2.75				U	2.75				U	2.75	$\rightarrow$	$\rightarrow$	$\overline{}$				-	-	
Continuous Risk Management	KIVI	1.70				- 0	2.75				U	2.75				U	2.75				U	2.75	$\rightarrow$	$\rightarrow$	-		2.75	$\rightarrow$		-	
TOTAL SAFETY AND MISSION ASSURANCE		E 10			E 100	E 100	7.75		0	C 714	C 714	7.75		n	C 040	0.040	7.75		0	0.005	0.000	7.75	_	- 0	7.105	7 105	7.75	- 0	-	7 207	7.007
TOTAL SAFETT AND MISSION ASSURANCE		5.10	- 0	- 0	5,192	5,192	7.75	- 0	- 0	6,714	6,714	7.75	U	U	6,848	6,848	7.75	U	- 0	6,985	6,985	7.75	-4	- 4	7,125	7,125	7.75			7,267	7,267
		_			_																	$\rightarrow$	$\rightarrow$	$\rightarrow$	$\rightarrow$		-	$\rightarrow$	-	-	
SUBTOTAL RMO PROGRAMS AND HQ		18.00	0	3,225	5,192	8,417	18.00	0	3,755	6,714	10,469	18.00	0	3,830	6,848	10,678	18.00	0	3,906	6,985	10,892	18.00	n	3,984	7,125	11,109	18.00	- 0	4,064	7,267	11,332
SUBTOTAL KINO PROGRAMS AND TIQ		10.00	- 0	3,223	3,132	0,417	10.00	- 0	3,730	0,714	10,405	10.00	- 0	3,030	0,040	10,070	10.00	- 0	3,500	0,000	10,052	10.00	-	3,504	1,120	11,105	10.00	- 0	4,004	1,201	11,332
																							-	-	+		-			-	
																							$\rightarrow$	-		-	-	-	-	-	
RMO INDEPENDENT ASSESSMENT																							$\rightarrow$	-		-	-	$\overline{}$		-	$\overline{}$
NASA GRC Independent Technical Authority (ITA)	A					0	3.00	473			473	3.00	482			482	3.00	492			492	3.00	502	-	$\overline{}$	502	3.00	512	-	-+	512
NASA Engineering and Safety Center (NESC)	A					0		47.0		158	158		402		161	161		472		164			302	-	168			- 112	-	171	171
re-cor, Engineering and datery center (HESC)						-	1.00			130	130	1.00			101	101	1.00			104	104	1.00	$\rightarrow$	$\rightarrow$	100	100	1.00	$\rightarrow$	-	-171	17.1
SUBTOTAL RMO INDEPENDENT ASSESSMENT		0.00	n	0	0	1 0	4.00	473	0	158	£21	4.00	482	n	161	644	4.00	492	n	164	656	4.00	502	n	168	670	4.00	512	- 0	171	683
SOBTOTAL RINO INDEPENDENT ASSESSMENT		0.00			-	, ,	4.00	47.3		130	001	4.00	402		101	044	4.00	432	- 0	104	030	4.00	302	-	100	670	4.00	312		-171	003
RMO ADMINISTRATIVE PROCUREMENTS	A		59			59		59			59		59			59		59			59		59		$\overline{}$	59	-	59	$\rightarrow$	-	59
			20			20		20			20		20			20		20			20		20		$\rightarrow$	20	-+	20	-	-+	20
Travel - Administrative note: Code Q travel included in SMA \$			20			20		20			20		20			20		20			20		20	-	$\overline{}$	20	-+	20	-	-+	20
note. Code of travel included in DIVIA 3						_	+																$\rightarrow$	$\rightarrow$	_	-	$\rightarrow$	$\rightarrow$	$\rightarrow$	-	$\overline{}$
							$\vdash$																						$\rightarrow$		
GRAND TOTAL		18.00	70	3,225	E 100																		$\rightarrow$	$\overline{}$							
ORAND TOTAL		18,00					22.00		2 700	6,872	11,179	22.00	504	2.000	7,009	11,401	22.00	F74	2,000	7.450	11,627	22.00	EO4	3,984	7 202	11,858	22.02	EO4	4,064	7.438	12.094

Work Process Key: P=Product Assurance S=Safety F=FAA RM=Risk Management R=Reliability & Maintainability S/W=Software Product Assurance Q=Quality Assurance Engineering (see QMO) A=ALL

# SAFETY AND ASSURANCE DIRECTORATE (Q) NASA GLENN RESEARCH CENTER QUALITY MANAGEMENT OFFICE (QV) OUT-YEAR RESOURCE ESTIMATES

Figure 24

			ACTUALS		1			R FY 2005				R FY 2006				R FY 2007				R FY 2008				OR FY 2009	
			FUN	IDING			FUN	DING			FUN	DING			FUN	IDING			FUN	IDING			FUN	IDING	
ACTIVITY	WORK PROCESS	CS		\$		CS		\$		cs		\$		cs		ŝ		cs		\$		cs		\$	
			INST	PROG	TOTAL		INST	PROG	TOTAL		INST	PROG 1	TOTAL		INST	PROG	TOTAL		INST	PROG	TOTAL		INST	PROG	TOTAL
QUALITY ENG	NEERING																								
	Aeronautics Research	0.6		94	94	0.6		95	95	0.6		97	97	0.6		99	99	0.6		100	100	0.6		102	102
	Science	0.6		94	94	0.6		95	95	0.6		97	97	0.6		99	99	0.6		100	100	0.6		102	102
	Exploration Systems	4.5		1,003	1,003	4.5		1,107	1,107	4.5		1,129	1,129	4.5		1,152	1,152	4.5		1,175	1,175	4.5		1,198	1,198
	Space Operations	0.3		47	47	0.3		47	47	0.3		48	48	0.3		49	49	0.3		50	50	0.3		51	51
QUALITY ASS	URANCE																								
	Critical Test & Inspection Validation	0.1	16		16	0.1	16		16	0.1	16		16	0.1	16		16	0.1	17		17	0.1	17		17
	Maintenance of Quality Management Documentation	0.1	16		16	0.1	16		16	0.1	16		16	0.1	16		16	0.1	17		17	0.1	17		17
	SMA Audit of Suppliers	0.1	16		16	0.1	16		16	0.1	16		16	0.1	16		16	0.1	17		17	0.1	17		17
	Development & Implementation of Quality Activities	0.1	16		16	0.1	16		16	0.1	16		16	0.1	16		16	0.1	17		17	0.1	17		17
	Audits of GRC Non-OSAT Quality Functions	0.1	16		16	0.1	16		16	0.1	16		16	0.1	16		16	0.1	17		17	0.1	17		17
QUALITY MAN	AGEMENT																								
	Preventive and Corrective Actions - ISO	0.1	16		16	0.1	16		16	0.1	16		16	0.1	16		16	0.1	17		17	0.1	17		17
	QASAR Management	0.1	16		16	0.1	16		16	0.1	16		16	0.1	16		16	0.1	17		17	0.1	17		17
	GIDEP	0.1	16		16	0.1	16		16	0.1	16		16	0.1	16		16	0.1	17		17	0.1	17		17
	Lessons Learned Database	0.2	31		31	0.2	32		32	0.2	32		32	0.2	33		33	0.2	33		33	0.2	34		34
MATERIALS A	ND PROCESSES	1.0		393	393	1.0		396	396	1.0		404	404	1.0		412	412	1.0		420	420	1.0		429	429
QMO ADMINIS	TRATIVE	2.0	316		316	2.0	316		316	2.0	322		322	2.0	328		328	2.0	335		335	2.0	342		342
	Civil Servant Travel	0.0	15		15	0.0	15		15	0.0	15		15	0.0	15		15	0.0	15		15	0.0	15		15
	Administrative Procurements	0.0	30		30	0.0	30		30	0.0	30		30	0.0	30		30	0.0	30		30	0.0	30		30
GRAND TOTAL		10.0	517	1,630	2,147	10.0	518	1,740	2,258	10.0	528	1,774	2,302	10.0	538	1,810	2,348	10.0	547	1,846	2,394	10.0	557	1,883	2,441

# SAFETY AND ASSURANCE DIRECTORATE (Q) NASA GLENN RESEARCH CENTER GLENN SAFETY OFFICE (QS) OUT-YEAR RESOURCE ESTIMATES

Figure 2-5

		А	CTUALS F	OR FY 200	4		PLAN FOR	R FY 2005			PLAN FO	R FY 2006			PLAN FO	R FY 2007			PLAN FO	R FY 2008			PLAN FOR	rigule 2-3 1 FY 2009	
			FUN	DING			FUND	ING			FUN	DING			FUN	IDING				DING			FUND	ING	
ACTIVITY	WORK PROCESS	CS	Wet	(\$)	TOTAL	CS	шет	(\$)	TOTAL	CS	шет	(\$)	TOTAL	CS	шет	(\$)	TOTAL	CS	Wet	(\$)	TOTAL	CS	шет	(\$)	TOTAL
SAFETY MAN	ACEMENT		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL
SAFETT MAIN	Safety Management System	1.0	20		20	1.5	15		15	1.5	15		15	1.5	16		16	1.5	16		16	1.5	17		17
	VPP Implementation	1.0	20		20	1.0	20		20		21		21	1.0	21		21		22		22	1.0	23		23
	Document Management	0.5	10		10	0.5	15		15				15	0.5			16				16	0.5	17		17
	Executive Safety Board	0.5	10		10	0.5	15		15				15	0.5			16				16	0.5	17		17
	Mishap Reporting	0.5	60		60	0.5	60		60		62		62	0.5			64				66	0.5	68		68
	Contractor Safety	1.0	25		25	1.0	25		25		26		26	1.0	27		27		27		27	1.0	28		28
	Area Safety Committee Support	0.5	20		20	0.5	20		20		21		21	0.5	21		21		22		22	0.5	23		23
	Glenn Safety Manual	0.5	10		10	0.5	15		15		15		15	0.5	16		16		16		16	0.5	17		17
SAFETY ENGI	NEERING																								
	Hazard Analysis Program	1.0	30		30	1.0	30		30	1.0	31		31	1.0	32		32	1.0	33		33	1.0	34		34
	Pressure Safety	0.5	50		50	0.5	50		50	0.5	52		52	0.5	53		53	0.5	55		55	0.5	56		56
	Construction Safety	1.5	20		20	2.0	20		20	2.0	21		21	2.0	21		21	2.0	22		22	2.0	23		23
	Fire Protection	1.0	65		65	1.0	15		15	1.0	15		15	1.0	16		16	1.0	16		16	1.0	17		17
	Safety Permit	1.0	50		50	1.0	50		50	1.0	52		52	1.0	53		53	1.0	55		55	1.0	56		56
	Mishap Investigation	0.5	10		10	0.5	25		25	0.5	26		26	0.5	27		27	0.5	27		27	0.5	28		28
SAFETY COM	PLAINCE																								
	Safety Training	0.5	40		40	1.0	40		40	1.0	42		42	1.0	43		43	1.0	45		45	1.0	47		47
	Emergency Response	2.0	10		10	2.0	15		15	2.0	15		15	2.0	16		16	2.0	17		17	2.0	17		17
	Emergency Preparedness	0.5	30		30	1.0	30		30	1.0	31		31	1.0	32		32	1.0	33		33	1.0	34		34
	Facilities Inspection	1.0	80		80	1.0	80		80	1.0	82		82	1.0	85		85	1.0	87		87	1.0	90		90
	Regulatory Compliance	1.0	80		80	1.0	60		60	1.0	62		62	1.0	64		64	1.0	66		66	1.0	68		68
	Lifting Devices	1.0	20		20	1.0	16		16	1.0	16		16	1.0	17		17	1.0	17		17	1.0	18		18
SAFETY ADM			45.		451		0.10				0.10		0.10		000						005		222		200
	Administrative Procurements		161		161		240		240		240		240		239		239		235		235		236		236
	CS Labor Cost		2,655		2,655		2,998		2,998 23		2,998		2,998		3,058		3,058 23		3,119		3,119		3,182		3,182
	Travel		23		23		23		23		23		23		23		23		23		23		23		23
GRAND TOTA		17.0	3,499	n	3,499	19.0	3,877	n	3,877	19.0	3,896		3,896	19.0	3,975		3,975	19.0	4,052		4.052	19.0	4,136		4,136
S. JIIID I JIA	-	11.0	0,700		0,700	10.0	0,017	- 0	1100	10.0	0,000		0,000	.0.0	0,010		0,010	10.0	7,002		7,002	.0.0	4,100		7,100

# SAFETY AND ASSURANCE DIRECTORATE (8000) NASA GLENN RESEARCH CENTER ENVIRONMENTAL MANAGEMENT OFFICE (8400) OUT-YEAR RESOURCE ESTIMATES

Figure 2-6

			PLAN FO	R FY 2004			PLAN FO	R FY 2005			PLAN FO	R FY 2006			PLAN FO	R FY 2007			PLAN FO	R FY 2008			PLAN FO	R FY 2009	
			FUN				FUNI				FUN														
ACTIVITY	WORK PROCESS	CS		(\$K)		CS		(\$K)		CS		(\$K)		CS		(\$K)		CS		(\$K)		CS		(\$K)	
			INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL
Occupatioanl	Health				,																,				
	Compliance	8.0	515		515	8.0	530		530	8.0	540		540	8.0	555		555	8.0	578		578	8.0	614		614
	Abatement	1.0	150		150	1.0	150		150	1.0	150		150	1.0	150		150	1.0	150		150	1.0	150		150
	Remediation	0.0				0.0				0.0				0.0				0.0				0.0			
	Outreach	1.0	4		4	1.0	4		4	1.0	4		4	1.0	4		4	1.0	4		4	1.0	4		4
	Medical Service and Fittness Center	1.0	1,270		1,270	1.0	1,285		1,285	1.0	1,330		1,330	1.0	1,376		1,376	1.0	1,424		1,424	1.0	1,473		1,473
	Employee Assistance Program	1.0	22		22	1.0	22		22	1.0	23		23	1.0	23		23	1.0	23		23	1.0	24		24
	Total Occupational Health	12.0	1,961		1,961	12.0	1,991		1,991	12.0	2,047		2,047	12.0	2,108		2,108	12.0	2,179		2,179	12.0	2,265		2,265
Environmenta	il																								
	Compliance	10.0	1,467		1,467	10.0	1,487	500	1,987	10.0	1,526	540	2,066	10.0	1,558	500	2,058	10.0	1,605	500	2,105	10.0	1,640	500	2,140
	Abatement	0.0				0.0				0.0				0.0	-			0.0				0.0			
	Remediation	1.0		1,895	1,895	1.0		2,000	2,000	1.0		2,000	2,000	1.0		2,000	2,000	1.0		2,000	2,000	1.0		2,000	2,000
	Outreach	1.0	2		2	1.0	2		2	1.0	2		2	1.0	2		2	1.0	2		2	1.0	2		2
	NETS			235	235			244	244			255	255			265	265			275	275			285	285
	Total Environmental	12.0	1,469	2,130	3,599	12.0	1,489	2,744	4,233	12.0	1,528	2,795	4,323	12.0	1,560	2,765	4,325	12.0	1,607	2,775	4,382	12.0	1,642	2,785	4,427
EMO ADMINIS	STRATIVE COST																								
	Administrative Procurements		6		6		195		195		36		36		37		37		39		39		41		41
	CS Labor Cost		3,749		3,749		3,787		3,787		3,863		3,863		3,940		3,940		4,019		4,019		4,099		4,099
	Travel		29		29		29		29		29		29		29		29		29		29		29		29
GRAND TOTA	L	24.0	7,214	2,130	9,344	24.0	7,491	2,744	10,235	24.0	7,503	2,795	10,298	24.0	7,674	2,765	10,439	24.0	7,873	2,775	10,648	24.0	8,076	2,785	10,861

## NASA GLENN RESEARCH CENTER

## PLUMBROOK DECOMMISSIONING OFFICE (QD)

## OUT-YEAR RESOURCE ESTIMATES

Figure 2-7

																									i iguic 2-r	
				ACTUA	L FOR FY 2	2004		PLAN	FOR FY 20	105		PLAN F	OR FY 2006	i		PLAN F	OR FY 200	7		PLAN F	OR FY 200	В		PLAN F	OR FY 2009	9
				F	UNDING			F	UNDING			FUI	NDING			FU	NDING			FUI	NDING			FUI	IDING	
Priority	ACTIVITY	WORK PROCESS	cs		\$K		cs		\$K		CS		\$K		cs		\$K		CS		\$K		CS		\$K	
				INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL		INST	HQTS	TOTAL
1	PLUMBROOK	M,A	2.9		43,400	43,400	2.9		30,500	30,500	2.9		10,221	10,221	2.9		1,867	1,867	0		0	0	0		0	0
					·					·				·			·	·								
1	PLUMBROOK TE	AVEL - COST CENTER		17		17		17		17		17		17		17		17		0		0		0		0
	TOTALS		2.9	17	43,400	43,417	2.9	17	30,500	30,517	2.9	17	10,221	10,238	2.9	17	1,867	1,884	0	0	0	0	0	0	0	0

## Work Process Key:

M = Management

A = Administrative